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All Eyes on Ghana

THE Gold Coast no longer exists. Long live Ghana! Such, briefly, was the spirit which animated the celebrations heralding the birth of the first African nation within the British Commonwealth to be granted self-government.

The eyes of the world are on Ghana and the progress of this bold experiment in African self-government will be very closely watched in other countries with related problems, and the manner in which Ghana's leaders measure up to the responsibility of governing a complexity of peoples with divergent customs and interests must inevitably have a profound influence on the future of racial relations in Africa. We ourselves believe that these leaders will show themselves capable of fully justifying the confidence which has been placed in them. In fact, Dr. Nkrumah himself has already given proof of a signal capacity for statesmanship.

The outlook of this new nation towards its destiny was aptly summarized by a tax-driver, who is reported to have told his fare: "We wanted you English out of the Gold Coast, but we welcome you to Ghana". Britain's constructive policy and the wise counsel of Mr. Lennox-Boyd have provided a fund of goodwill towards this country, which augurs well for future co-operation.

Ghana has acquired self-government at a time when its balance of payments has been adversely affected by a sharp fall in the world price of cocoa. Though the government's financial reserves are considerable, amounting to some £200,000,000 held in the form of sterling balances, prudence and restraint are clearly desirable to avoid dislocation of the national economy by over-ambitious development programmes, and it is to be expected that Dr. Nkrumah's government will look to Britain for the maximum assistance which our own over-strained economy will permit, and it is also to be hoped that the recent visit of the World Bank's mission will bear fruit. Meanwhile, British manufacturers will no doubt have taken due note of the offers of American technical aid reported to have been made to Dr. Nkrumah by Vice-President Nixon who has been attending the inaugural celebrations this week, as well as of the British government's reported invitation to Canada to consider giving economic aid to Ghana on similar lines to the aid she is already giving to the three Asian members of the Commonwealth.

There is, of course, no lack of opportunity for investment in this large, undeveloped country with its immense natural resources, and in this connection it is noteworthy that the interests of overseas investors are protected by safeguards in the Constitution.

Gold mining has long made a substantial contribution to employment and revenue in the Gold Coast. The production of manganese and bauxite has been increasing, though not at a spectacular rate, and it would be surprising if future prospecting does not uncover other minerals in exploitable quantities.

By far the largest project currently under consideration is, of course, the huge Volta River project, which was first mooted several years ago. The cost of this scheme is now estimated at

about £240,000,000, and now that Ghana has achieved self-government the way is open for the negotiations to be brought to finality, one way or another.

WHO WILL SHARPEN THE SAW?

At the annual meeting of the Association of Mine Managers of South Africa, the retiring president, Mr. W. F. Thomas, took up the question of the continuing and now apparently chronic shortage of qualified mining engineers and the way in which this hampers the fight against rising costs and increased efficiency in the gold mining industry.

Towards this he said there could be a short-term programme aimed at making better use of existing equipment and methods. That there were potentialities in this was shown by recent isolated outstanding records in shaft-sinking and tunnelling. Under this head there is a strong possibility of an improvement in methods of gold recovery. From his own experience, said Mr. Thomas, he was of the opinion that, at very little expense, this could be raised by at least ½ per cent, which would represent additional production worth about £1,000,000 a year.

Unfortunately, the serious obstacle in the way of operating the short-term programme is the shortage of trained men. The few technically trained men cannot be spared from the production line for investigation or study work. As Mr. Thomas put it, the job of sawing was so important that it could not be stopped to sharpen the saw.

The second course advocated was a long-term programme of research to discover improved technical methods. Admittedly, a fair amount of work was being done, such as that into rockbursts and that related generally to services in the mines by the Chamber of Mines' research laboratories. Mr. Thomas, however, envisaged work on a much larger scale than this. But here again, a barrier is presented by the lack of trained men.

In spite of the Official Learner Scheme with its generous system of bursaries, mines have not been able to replace wastage of junior officials. In fact many mines continue to report the necessity to promote insufficiently qualified men to fill gaps in the ranks of junior officials. Apart from the greater burden on management, there is a lowering of standards. This is clearly shown in the tonnage-duty figure for the industry which, after showing a steady annual rise to 33.1 tons/native/month in 1953, has dropped back to 32.4 in 1956. Until the wastage of experienced officials can be stopped this deterioration will continue.

Mr. Thomas told his audience that in his opinion the articles by Prof. R. A. L. Black in *The Mining Journal* correctly affirmed the reasons for the lack of popularity of mining engineering in the country.

"It is not sufficient," said Mr. Thomas, "to persuade the intelligent youth to take up mining engineering as a career. We must also retain his services by providing him with job satisfaction. He must not immediately be submerged in the production line, but given opportunities for creative use of his technical training. He must be informed of plans for his development and encouraged by good personnel relations. Then he should be promoted as rapidly as his abilities will permit to a senior executive position carrying comparatively higher social and financial status. Such treatment will cause a reversal of the present unpopularity of the industry and open the door to our vital requirements of technical personnel."

The difficulties imposed on mine management by the nature of the organization structure normally found in South African mines, and the problems involved in providing a more streamlined system for the delegation of managerial authority, were discussed in a series of articles published recently in *The Mining Journal* (9/11/56, pp. 555, 556, 558 and 559; 16/11/56, pp. 592 and 593; 23/11/56, pp. 622 and 623). As we have already pointed out, the crux of the problem is management training. The manager can only delegate authority to subordinates who, in addition to their technical qualifications, are managerially equipped to assume added authority and responsibility. We believe that next to an increase in the gold price, the industry's most pressing need to-day is an adequate supply of such young men.

TANGANYIKA'S MINING YEAR IN 1956

Once again Tanganyika can claim the distinction of having been "first with the news", inasmuch as it appears to be the first of the colonial territories to publish a review of the mining industry in 1956.

The Department of Mines estimates the value of mineral production in 1956 at £5,450,000. Exports (domestic production) were valued provisionally at £4,949,633, or a little under 3 per cent less than in the preceding year, and local consumption at £423,189—an increase of nearly 7 per cent.

The slight decline in value of exports was due to a fall in production of gold and associated silver, and a heavier decrease in the overall value of diamonds realized, though, in terms of weight, diamond exports exceeded those of 1955 by 11 per cent. The full impact of these decreases was largely offset by an increase in the quantity of lead concentrates exported.

The fact that diamonds were an estimated 13 per cent lower in total value than in 1955 does not present an entirely accurate picture of the year's results, since a number of the larger and more valuable stones recovered had not been realized before the end of the year.

At the Mwadui Mine of Williamson Diamonds Ltd. a new recovery plant employing heavy-media separation and grease belts, and having a designed capacity of some 7,000 - 7,500 tons of gravel a day, was completed and put into commission. Due to teething troubles the plant had not reached full capacity by the end of the year, but the quantity of gravel treated was more than three times greater than in 1955. Owing to the higher efficiency of this plant the proportion of smaller and less valuable stones recovered was larger than in the past.

Gold production from reef and alluvial sources declined by 14 per cent. The greater part of the decline was due to the closing-down of New Saza Mine in September following exhaustion of the ore reserves. This was the second largest gold mine in Tanganyika. During the 18 years of its productive life, from 1939 to 1956, the mine milled 1,100,524 tons of ore for a recovery of 270,770 oz. of fine gold and 242,942 oz. of fine silver, which together realized a total of £2,786,400.

The loss of this producer will be compensated in due course by the coming into production of Kiabakari Mine in Musoma District. At this mine, the Colonial Development Corporation in partnership with New Consolidated Gold Fields are preparing to install a mill which, it is believed, will have a capacity of some 15,000 - 20,000 tons of ore a month.

All lead production was from the mine of Uruwira Minerals Ltd. at Mpanda, and was in the form of lead-silver-copper-gold concentrates exported to Belgium for smelting. There was an increase in output of 62 per cent compared with the preceding year. For the first time the value of these exports exceeded that of gold.

During 1956 the Uluguru Mica Mining Co-operative Society Ltd.—all members of which are African smallholders—disposed of 57,947 lb. of cut sheet mica valued at £23,800. This quantity was more than double the amount produced by the Society in 1955, and nearly half the total Tanganyika production in 1956.

Development of the Panda Hill niobium-bearing pyrochlore deposit near Mbeya was pressed forward by the Mbeya Exploration Co. Ltd., a company owned jointly by N. V. Billiton Maatschappij and the Colonial Development Corporation. It is anticipated that a pilot mill with a capacity of 150-200 tons of ore a day will be in operation by about August, 1957.

Trial shipments were made of small quantities of copper ore, garnet and crude graphite. Gypsum production increased. Magnesite was mined in small quantities in the Northern Province for export to Kenya. The output of tin and tungsten concentrates decreased. In the case of tin this was mainly due to suspension of production by the principal producer—Kyerwa Syndicate Ltd.—pending installation of a 1,000-ton a day mill, on which work was commenced.

An outstanding feature of the year was the great increase in aerial prospecting that took place. Under a scheme introduced by the Mines Department, exclusive short-term rights to carry out air reconnaissances with scintillometer and/or geophysical equipment are granted to suitable applicants on a basis of "no results no charge".

This scheme proved attractive, not only to large mining houses but also to private prospectors owning their own light aircraft. At the end of the year 12 special and 2 ordinary exclusive prospecting licences covering areas aggregating more than 35,000 sq. miles had been granted or approved under the scheme, in addition to other licences current before the scheme was introduced. The principal holders were the Anglo American Prospecting Co. (Africa) Ltd., New Consolidated Gold Fields, and Williamson Diamonds. The report emphasizes that Tanganyika is a large country; 35,000 sq. miles represent less than one-tenth of its area, and there is still plenty of room for other prospectors.

The Department of Mines points out that, while 1956 might fairly be regarded as a year of steady progress, the pace could be faster if the gold mining section of the industry were not handicapped by a fixed gold price.

PROSPECTING AFRICA BY AIR

Airborne geophysics is now firmly established as a rapid and economical means of carrying out resources inventories of mineralized areas before ground sampling begins. In all parts of the world where the search for minerals has spread from the more accessible regions into vast areas of remote and difficult terrain, geophysical investigations are being carried out by aerial methods to a rapidly increasing extent.

In Africa air reconnaissances with scintillometer or geophysical equipment are in progress over enormous tracts of country. A pointer to the scale on which they are being employed by the leading mining groups is given by the announcement that the Rhodesian Selection Trust has placed a contract with Hunting Geophysics (a member of the Hunting Group) for an airborne electromagnetic and radiometric aerial survey over three areas of the Northern Rhodesian Copperbelt—a total of 3,700 line miles.

This news is in line with observations made recently by Sir Ronald Prain at an informal shareholders' meeting in London, when he stated that it would be the policy of the R.S.T. group to carry out extended aerial surveys of the wide tracts held under prospecting rights before tackling promising areas in any detail. Sir Ronald emphasized that this policy would inevitably delay the date when any practical results could be expected, but it was his view that in the long-term greater results would be achieved much more quickly. Moreover, the technology of geophysical search was now advancing so rapidly that, in a sense, time lost was a gain, in that work carried out perhaps a year hence might well be more fruitful than the same work carried out to-day.

MORE MINES FOR EIRE ?

The rapid expansion of the mining industry in Eire, backed by Canadian capital and sparked by Canadian "know-how" continues unabated, and recent reports from the Emerald Isle serve to emphasize how stimulating enlightened tax laws can be.

A new mining concern, to be known as Inistioge Mining Co. Ltd., has been formed in County Kilkenny to exploit silver, lead and zinc deposits in the Inistioge and Knockdrina districts of the county. It is reliably understood that the formation of the new company follows a survey of the old deposits made by Canadian mining experts. The company will operate as a subsidiary of a Canadian group, and will develop the mines with modern machinery made available from that source.

A further report states that the Mining Corporation of Ireland—a subsidiary of the Mogul Mining Co. of Toronto—is to carry out a survey of the old copper, lead and zinc mines at Ringabella, near Cork. Talks have taken place between local officials and representatives of the Mining Corporation and it has been announced that mining experts will shortly visit the area to undertake a survey of the potentialities. If the results of the survey warrant it, application will be made to the Department of Industry and Commerce for prospecting facilities.

Yet another report reveals that officials of the New Spring Coulee Mining Corporation of Toronto are carrying out a survey of mineral deposits in various parts of County Donegal, and also in Connemara. Deposits of molybdenite have already been located at Murvey, in Connemara, and about a dozen landowners in the nearby district of Roundwood have been circularized by the Department of Industry and Commerce, pointing out that Canadian officials would shortly survey their holdings for traces of molybdenite and lead. A number of disused lead mines exist in this area. In County Donegal, there are known deposits of lead, zinc and copper.

POOL COAL IMPORTS

The six nations of the European Coal and Steel Community imported nearly twice as much coal from the United States last year as in 1955 according to recently published High Authority statistics. These show that in 1956 the Pool countries—France, Western Germany, Italy, Belgium, Luxembourg and Holland imported 30,200,000 tons of U.S. coal compared with 15,900,000 tons the year before, and only 6,200,000 tons in 1954. Coal imports by the Pool countries now amount to 14 per cent of consumption, as against the 9 per cent of 1952.

Over the past four years Belgium's coal imports have increased by 141 per cent—the largest increase of any community country. The Netherlands has the next largest increase at 88 per cent, then Western Germany with 76 per cent, followed by France and Italy with 64 per cent and 50 per cent respectively. Luxembourg has stocked up almost completely with coal produced inside the Community.

The Opening Of Algom

THE Quirke Lake and Algom-Nordic mines, each with a milling capacity of 3,000 tons of ore a day, are working to produce uranium oxide for sale to Eldorado under a contract covering the period ending March 31, 1962. The total sum payable under the contract will be Can. $206,910,000. The entry into production of these mines marks an important stage in the development of the Rio Tinto Group. At the end of 1954 the parent company sold its interests in the famous Rio Tinto Mines in Spain which it had operated since 1873, to a Spanish company, the Compania Espanola de Minas de Rio Tinto, S.A. The sale was partly for £7,666,666 payable in instalments and partly for shares, constituting one-third of the capital of the new company. Since then the Rio Tinto Group have been engaged in the exploration and development of new mines in the British Commonwealth, most notably in Canada, Africa and Australia.

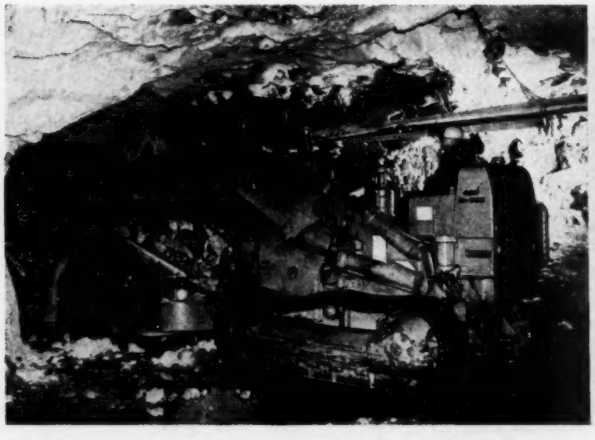
Algom Uranium Mines Ltd. was incorporated in July, 1953, under the auspices of Preston East Dome Mines Ltd. and Mr. J. H. Hirshhorn. The company required to raise major finance towards the end of 1954. Discussions were started with Rio Tinto, whose exploration team was already operating in Canada. The result was the meeting of mutual needs. Rio Tinto had no mine, but had just received the first payment from Spain; Algom urgently needed finance.

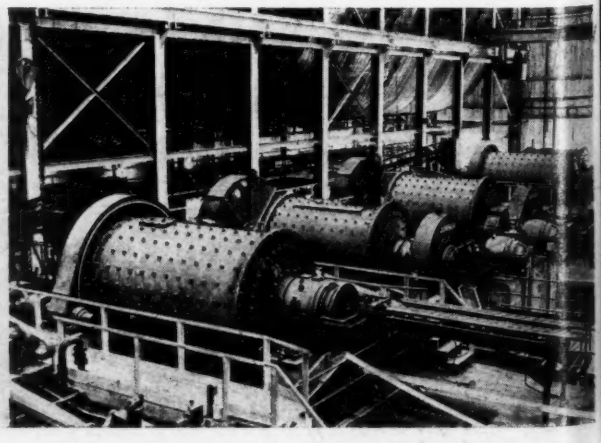
The important negotiations which followed brought European finance into the Canadian uranium field, and started the Rio Tinto Group on their development in Canada. In all Can. $41,000,000 was raised, of which a consortium of the following, Commonwealth Development and Finance Corporation, N. M. Rothschild and Sons, Robert Benson, Lonsdale and Co., Groupe Lambert, Banque de la Societe Generale de Belgique, Amsterdam Overseas Corporation, took up nearly Can. $16,000,000 debentures.

The Rio Tinto Mining Company of Canada Ltd. was given the management of the mines, subscribed for 100,000 $1 shares at $11 each and obtained an option to subscribe for 500,000 further $1 shares at $11 each prior to March 2, 1959. Recently The Rio Tinto Company, Ltd., has increased its equity holding in the Rio Tinto Mining Company of Canada Ltd. from just over 40 per cent to just over 50 per cent.

Sufficient preliminary drilling of both properties had been completed by May, 1954, to justify the commencement of shaft sinking at Quirke, and the Nordic shaft was started some seven months later, on December 9, 1954. The original development and construction timetable called for the commencement of operations at the Quirke Mine in December, 1956, and at the Algom-Nordic Mine at the end of March, 1957. In the event, however, Algom Uranium Mines Ltd. succeeded in shortening the construction period by some three months, so that the Quirke crushing plant actually started in September, 1956, and the Nordic crushing plant in January, 1957. The first uranium oxide was produced at the Quirke Mine on October 9, 1956.

Above, the Algom Quirke Mine. Below left, a Cat 955 dumping spoil into a rubber-mounted shuttlecar. The scene is typical of Algom Nordic's trackless underground operation. Below right, a section of the Algom Quirke ball mill, where six units will be operated to crush uranium-bearing ore





The official opening of the Quirke Lake and Algom-Nordic mills by the Hon. George Prudham, Canadian Minister for Mines and Technical Survey on February 16, marked another step forward in the exploitation of the Blind River uranium bearing conglomerate beds and, at the same time, constitutes a remarkable achievement by Algom Uranium Mines Ltd., which are managed by The Rio Tinto Mining Company of Canada Limited.

The two properties are situated in the Blind River area, the Quirke Lake Mine being some 25 miles from the main highway and the railway and the Algom-Nordic Mine being somewhat nearer, lying about 15 miles by road from the highway. The only link with the highway and the Canadian National Railway system has been a somewhat rudimentary road which was bulldozed through the bush in the early days of the discovery in order to provide access to the Blind River area for drill crews, diamond drilling equipment and the like.

Another fact which makes the achievement a notable one is that certain items of the treatment plant equipment were among the first to be installed in Canada; in particular the two ion exchange plants for the treatment of the acid leach liquors, the large acid proof filters and the rubber-lined thickeners for the counter current decantation washing. The lining of these 100 ft. dia. vessels was rubber lining on a scale probably never previously attempted in Canada.

To serve these two mines and to secure adequate supplies of labour, it was necessary to construct a complete townsite at Elliot Lake, which is situated some 15 miles from the highway in the neighbourhood of the Algom-Nordic Mine.

During the first part of the construction period, all power was supplied by small diesel driven units, but the Ontario Hydro-Electric Power Co. put in a line to the two properties which was completed during the first week of July, 1955.

The condition of the road during the spring thaws was extremely bad and great care had to be exercised in the timing of the transportation of construction stores in order to make sure that work would continue through the break-up period during which the road became virtually impassable for heavy equipment.

The magnitude of this achievement can be gathered from a scrutiny of the following leading particulars of the two mines and the two treatment plants:

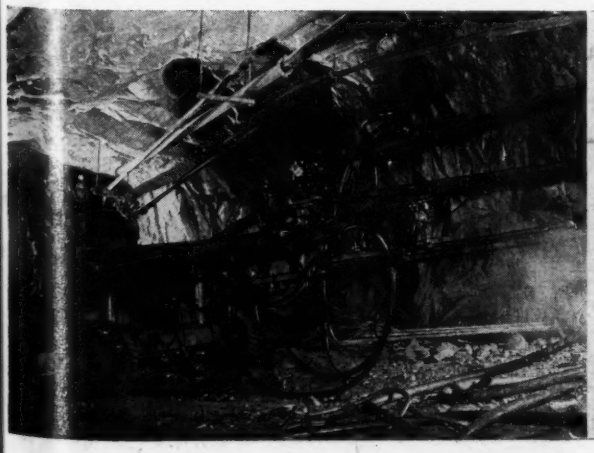
	Quirke	*Algom-Nordic*
Rated output, s.tons/year ...	1,000,000	1,000,000
Total number of employees ...	680	620
Depth of main shaft	864 ft.	870 ft.
Total ft. of lateral development	35,627*	15,445†
Size of skips	7 tons	7 tons

* Up to August, 1956 (end of pre-production development).
† Up to November, 1956.

It is of interest to note that both the Quirke Lake and Algom-Nordic treatment plants use similar equipment for crushing, grinding, leaching, ion exchange and precipitation.

The two mills are served by common precipitate, drying, packaging and despatching plant, which is situated at the Algom-Nordic Mine, Quirke precipitate being transported in tank cars as a slurry to this plant. There is no acid plant attached to either of the two treatment plants, acid being supplied by the Noranda Mines Ltd., who have installed a plant at Cutler on the main railroad and highway, using the Noranda process by which pyrites is converted partly to sulphur and partly to acid.

Above, Algom Nordic Mine. Below left, a drill jumbo in an underground drift at Algom Nordic. Below right, sampling the classifier overflow in the Algom Quirke ball mill



Progress of Mexico's Mining Industry

Mexico's mining industry is reviewed by the Counsellor (Commercial) to H.M. Embassy at Mexico City in an economic survey issued by the Board of Trade (Mexico, H.M.S.O., price 5s. 6d. net) stating that mining is Mexico's oldest industry; the survey points out that it has also been the nation's "Cinderella" industry.

UNTIL towards the end of the nineteenth century the famed silver mines of Mexico's colonial days were those in which the outside world took the greatest interest. Gold was often found alongside silver, as it is to-day, but its importance was secondary. Lead, zinc, and copper, were mined in the nineteenth century, but no especial interest was displayed in them until the beginning of the present century. To-day, Mexico has a varied mineral industry in which lead, zinc, copper, silver, gold, iron, coal, manganese, mercury, graphite, bismuth, cadmium, antimony, arsenic and molybdenum are important. Recently titanium, uranium and sulphur have been added.

Before the second world war, mineral exports accounted for roughly 50 per cent of total exports; even to-day, when the whole emphasis of government economic policy is on agriculture and industry, they average at least 20 per cent. The industry also contributes handsomely each year by taxation to the country's budget revenue.

Mining Legislation

According to the Mexican Constitution all minerals are the property of the nation, but mining concessions can be obtained through the Ministry of Economy. Some of the laws and regulations governing the industry were revised in 1954 and finally approved at the end of 1955 (*The Mining Journal*, 28/9/56, p. 356). The law allows for the constitution of a National Commission for Non-Renewable Natural Resources, whose task is to encourage official exploration; it also provides for special reductions in income tax for exploration costs. It prohibits the authorities of States and Federal territories from taxing production, exports, and the buying and selling of ore, metals and metallic compounds and reduces Federal taxes by 50 per cent in the case of new mines and also in the event of work being resumed in mines which have been inactive for ten years or more.

It is unfortunate that until quite recently little has been done in the revision of the mining law to assist the industry. Many of the high-grade ore deposits being worked to-day are nearly exhausted and latterly exploratory work has not been carried out to the extent necessary because, owing to the incidence of taxation, insufficient new capital funds have been forthcoming. New money has only gone into exploration when world prices for minerals were high and when the price trend appeared to be stable. The new mining law recognizes that exploratory work has been deficient.

It is too early, states the Survey, to say whether the new Mining, Tax and Development Law will raise the status of the mining industry. Even at this early stage, however, there are indications that taxation relief is stimulating the flow of new investment into an industry which has long been suffering from capital starvation (*vide The Mining Journal*, 11/1/57, p. 46).

In 1955 the industry enjoyed a bumper year and production and revenue figures were an improvement over those for 1953 and 1954. World prices for non-ferrous metals were high and steady. This trend of prosperity continued during the first half of 1956, giving rise to a greater feeling of confidence in the industry than there had been for several years.

Mexico is the world's leading producer of silver, which is found nearly all over the country—usually together with lead, zinc and copper. Production amounted last year to 44,000,000 oz., which compares with 48,000,000 oz. in 1955 and 39,900,000 oz. in 1954.

There are many operating companies, the most important being the American Smelting and Refining Co.; the American Metal Corporation's associated company, Compania Metalurgia de Penoles, S.A.; and the government-owned Compania del Real del Monte y Pachuca. Smelting plants exist in various parts of the country, but the principal metallurgical plants are in Chihuahua, San Luis Potosí, Monterrey and Torreon.

Gold is also found nearly all over Mexico and often in the same locality as silver. In the list of world producers Mexico stands ninth. There is no doubt that the present production—which has remained relatively stable since the war within the approximate range of 12,000-15,000 kg. annually—does not represent an optimum exploitation of the country's resources. It is believed that in many of the inaccessible spots of the great Sierra Madre range of mountains, and in the waters that run away from these heights, there are many rich gold-bearing deposits.

The refining facilities in the country for gold and silver are considered to be sufficient for local production.

Lead, Zinc and Copper

The production of lead, zinc and copper is mainly for export. In recent years domestic consumption has been increasing as a result of the development of metallurgical industries, but it still represents only a small proportion of production. The leading producing areas are in the States of Chihuahua, Sonora, San Luis Potosí, Zacatecas and Coahuila.

In 1955 Mexico produced 210,815 tons of lead, 269,399 tons of zinc and 54,675 tons of copper. In January-July, 1956, outputs of these three metals were respectively 114,099, 130,677 and 33,588 tons.

The principal mines and processing plants in Mexico are owned and operated by foreign companies. This has arisen largely because the net profits obtained from mining have been unattractive compared with those arising from other economic activities. The most important companies connected with the mining and processing of lead, zinc and copper are the American Smelting and Refining Co., the American Metal Co., and the Anaconda Copper Mining Co.

American Smelting and Refining has smelters at Chihuahua for lead and zinc, and at San Luis Potosí for lead and copper. Arsenic is also treated in the latter plant. The company also operates an important refinery at Monterrey for silver and gold and has installations at Nueva Rosita (Coahuila) for zinc and at Sabinas (Coahuila) for coal and coke. It uses ore from its own mines and also from independent concerns.

The American Metal Co. has a large lead smelter at Torreon (Coahuila) and a refinery at Monterrey. It obtains its ores from its own mines and from other sources. Anaconda works in Mexico through its associated company, the

Cananea Consolidated Copper Co., which operates large mines in the State of Sonora and has an important copper smelter at Cananea (Sonora).

The U.K. has interests in three other companies which have mines in Mexico—San Francisco Mines of Mexico, the Fresnillo Co., and the Mazapil Copper Co.

Other Products

Deposits of coal and iron are distributed widely throughout the country. Unfortunately, most of them lie far apart from each other and in many cases they are situated far from existing railways and good highroads.

The coal is bituminous and anthracite. The one coalfield being seriously exploited is that of the Sabinas Basin in the State of Coahuila, which has been worked on a large scale since 1884 and supplies 86 per cent of the country's present-day needs. Another 13 per cent is obtained from adjoining fields, Saltillito and Fuente. The reserves in these fields are estimated at 1,940,000,000 tons. Bituminous deposits in the State of Oaxaca are estimated to total 100,000,000 tons, but these are not yet being worked on a serious commercial basis.

Iron ore is known to exist in the States of Durango, Chihuahua, Colima, Michoacan, Guerrero, Veracruz, Sonora and Oaxaca. Reserves are estimated to total at least 300,000,000 tons, but many of the known deposits have only been superficially surveyed.

The Durango mines—known since before the Spanish Conquest—are the main suppliers of iron ore for Mexico's steel industry. They are mechanized and modern in every respect.

It is likely that mines at Colima and at Talatita, State of Veracruz, will be worked within the next few years.

Sulphur is at present the most important of the recent mining discoveries in Mexico. If present estimates of reserves are accurate, it should contribute handsomely to revenue and exports.

One paying mine has been that of the Negociacion Minera de Azufre in the State of San Luis Potosí, producing rock sulphur. Until quite recently the balance of Mexico's requirements was provided by Petroleos Mexicanos, the nationalized oil industry, from a sulphur extraction plant at the Poza Rica oilfield.

In 1954 and 1955 two companies organized with American capital and assisted with Export-Import Bank loans began producing sulphur at San Cristobal, on the River Coachapa, and at Jaltipan on the highway between the towns of Veracruz and Minatitlan. The productive capacity of the one company is 2,000-2,500 tons a day, while the other company has produced up to 600 tons a day. A third company is fast beginning to produce.

622.445

Siting Fans for Mine Ventilation

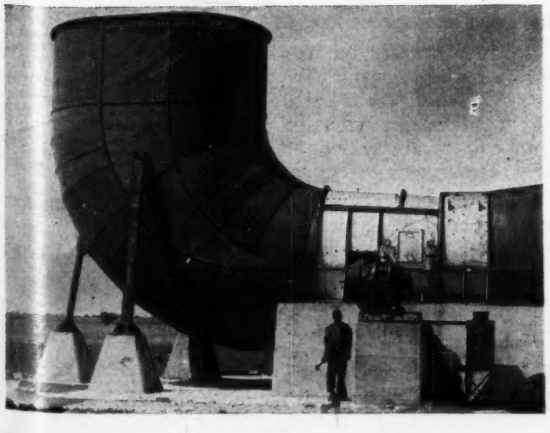
The efficient ventilation of mined workings is an ever-present problem, and axial and radial flow fans both have an important rôle in the mining industry. The following article describes the experience of Aerex Ltd. in developing these fans.

AN axial flow fan in which the air leaves the rotor in a direction substantially parallel to its axis is usually the choice when the duty requirements in a mine call for a fan having a high volume/pressure ratio.

The installation of Aerex high efficiency fans at the surface, where main ventilation fans are normally sited, is usually straightforward, particularly with the number of driving arrangements that may be employed. The axial flow fan is normally arranged in a horizontal position and is built into a drift from the upcast shaft. The fan, motor house, and diffuser, are at ground level but where space is restricted the fan or the fan and motor house may be installed immediately below the ground.

When a shaft is used purely for ventilation an axial flow fan may be mounted in a vertical position. The air is normally exhausted from the mine, passing through the axial flow fan and diffuser to atmosphere, but the fan may also be connected to a downcast shaft by means of a drift, in which case air is forced through the mine workings. This application requires careful consideration, particularly with regard to siting and connection with the downcast shaft.

Side drive axial flow fan at Wankie Colliery, Southern Rhodesia



Where axial flow fans are required to handle large volumes of air it may be economical to install two fans working in parallel but it is becoming increasingly common in modern mine practice to use two fans each capable of taking the full ventilation load, giving 100 per cent standby.

The prime mover may be either through the medium of an electric motor, a steam or diesel engine, and if Vee-belts are used these may be taken through the side of the fan casing. Alternatively, the fanshaft may be extended through the diffuser and indirectly driven by Vee-belts or gearbox. Alternatively, the prime mover may be coupled direct to the fanshaft extension, the latter arrangement being usually the most compact.

The design of the Aerex patent rotor is such that a large range of equivalent orifice can be met at high efficiency. Changing conditions can usually be catered for by speed change or adjustable pitch blades, or a combination of both. The Aerex axial flow fan is reversible and, in the case of an electrically-driven unit, the provision of a simple reversing isolator in the switchgear enables a change of direction of the airstream to take place. This feature eliminates the use of a by-pass and fully meets the requirements of mine regulations regarding reversibility.

The essential components of high efficiency axial flow fans are a main casing of ample thickness, one or more rotors depending upon the duty required, guide vanes, shaft and bearings, and necessary streamlined fairings. The rotors are truly the heart of an axial flow fan. Aerex patent rotors are based on sound aero-dynamics and usually are of fabricated construction. The blades are of hollow form manufactured in stainless steel, being shaped and finished to templates of true aerofoil section.

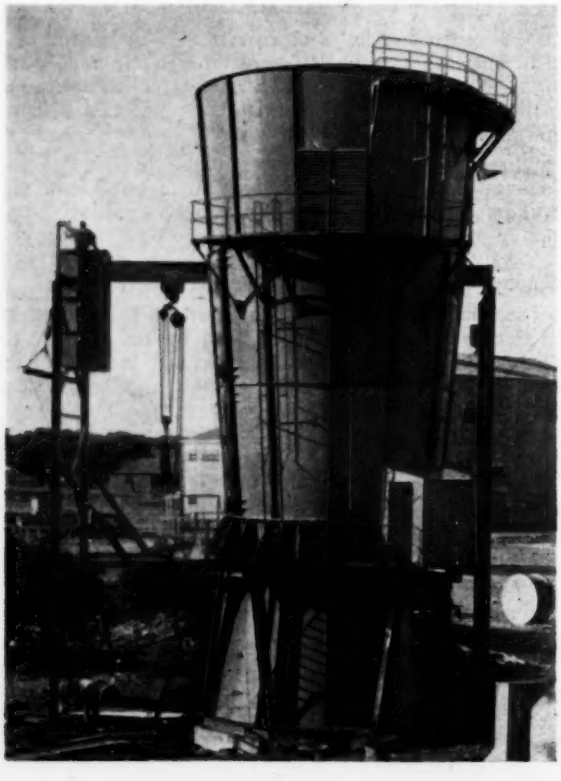
Radial Flow Fans

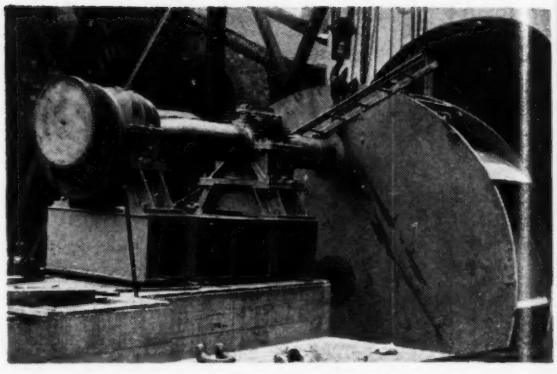
A radial flow fan in which the air leaves the impeller in a direction substantially at right angles to its axis is normally the choice when the duty requirements of a mine call for a low volume/pressure ratio.

As main ventilation fans these units are normally installed at surface although, as with the axial flow fans, they may be situated immediately below the surface if the site is restricted. Where high water gauges are required, Aerex high efficiency radial flow fans will take up considerably less ground area than will the equivalent axial flow fans and the installation will generally be cheaper.

The fan is usually built in a horizontal position into a drift from the upcast shaft, the exhausted air passing through the fan and diffuser to atmosphere. It may also be connected to a downcast shaft either by means of a drift or built directly above the shaft in which case the air is forced through the mine workings. Aerex high efficiency radial flow fans can be designed equally well for single or parallel operation, but as with the case of the axial flow units, it is becoming increasingly common in modern mine practice to use two fans each capable of taking the full ventilation load, giving 100 per cent standby.

Vertical axial flow fan passing 1,000,000 c.f.m. at 5 in. W.G. at Mufulira, Northern Rhodesia





Single inlet fan during erection at Sherwood Colliery

The prime mover may be either electric motor, steam or diesel engine, and it may be connected to the fanshaft directly or indirectly by means of Vee-belts or gearbox.

There are essentially two types of blade used in Aerex radial flow impellers for mine ventilation fans at the present time. One type of impeller has backward inclined blades of single thickness and when Aerex radial flow fan is fitted with an impeller of this type it is known as a hyperform fan. The other type of impeller has backward inclined blades of aerofoil section and the radial unit thus fitted is termed an aeroform fan.

The hyperform fan has a peak total efficiency of 87 per cent and the aeroform an efficiency of 92 per cent. Both types of fan can be of single inlet or double inlet design.

The radial flow fan is not reversible and where mine regulations call for the provision of reversed airflow it is necessary to provide a system of reversal ducts and dampers. When two fans are installed, one being used for full standby, reversed airflow may be obtained by returning the air to the mine through the standing fan.

Booster and Auxiliary Ventilation Fans

Fans for booster ventilation are usually installed underground when it is required to pass the whole of the air in a given circuit in order to increase the pressure in that circuit with the object of increasing the available volume of air. The fans may be of axial or radial flow design. Full consideration should be given to any likely interference with the main ventilation fan.

The siting of a booster fan is of marked importance and particular attention should be paid to possible leakage. The fan may be installed either in the intake or the return, the latter site being usually the more convenient.

When a booster fan is called for, the duty conditions which usually have a low volume/pressure ratio favour the high efficiency radial flow design. This type of fan has disadvantages from the point of view of installation, owing to the air leaving the impeller at right angles. This can be overcome by employing an inlet box on the fan.

The high efficiency axial flow fan having a tubular form is more convenient for installation underground since the air travels axially through the fan. This type of fan is almost universally the choice for booster ventilation.

Auxiliary ventilation fans are used to give improved ventilation at the work face and similar sites, and for new drivages and headings. Both axial and radial flow fans are employed, but for medium water gauge requirements the axial flow fan is the more common.

MINING MISCELLANY

The Greek Delphi Bauxite Co. recently has made its first post-war export shipment. The shipment was part of a foreign order for a total of 25,000 tons of bauxite.

*

In January, Ontario prospectors staked and recorded a total of 2,492 mining claims throughout the province. The greatest activity during the month was shown in the Sudbury area, where 522 claims were recorded. The other top divisions were Porcupine and Sault Ste. Marie.

*

Some 6,500,000 tonnes of pig iron were produced in Poland in 1956—400,000 tonnes more than in 1955. The output of steel, for the first time in Poland's history, exceeded 5,000,000 tonnes, being 550,000 tons higher than in 1955. The targets for 1956 were achieved with regard to copper, lead and aluminium, but not to zinc.

*

Survey teams preparing electrical transmission lines for Kariba have cleared a 4 ft. wide passage through 500 miles of virgin bush in Southern and Northern Rhodesia. This is only part of the task of building 3,600 pylons and laying nearly 1,000 miles of inch-thick cable to carry Kariba's electrical output over the Federation.

*

Coal production in the Zonguldak basin, Turkey, has reached 18,500 tons per day. Since 1950, £T400,000,000 has been invested in the Zonguldak basin. It is hoped that by 1958 Turkey will be able to produce 10,000,000 tons of coal per year. A second coal washing installation is to be erected at Zonguldak.

*

In partnership with the government of India, Imperial Chemical Industries' subsidiary, Indian Explosives, is building a £3,000,000 explosives factory at Gomia, in Bihar. The plant is expected to start production some time next year. It will have an annual capacity of 5,000 tons of explosives, estimated to be the present requirement of India.

*

Burma is depending on Malaya to supply her with tin-making equipment. U Ba Shwe, Permanent Secretary of the Ministry of Mines, who is leading a six-man purchasing mission, stated in Singapore that the group would buy more than $300,000 (Malayan) worth of equipment—mainly surface pumps and monitors — from the Federation of Malaya and would buy more in the future.

*

Work on the building of the Luanshya branch of the Copperbelt Technical Foundation will soon be started on a site which has been offered at a nominal rent by Luanshya Municipal Council. Other branches are being constructed simultaneously at Chingola, Mufulira and Kitwe. The Copperbelt Technical Foundation will be responsible for the theoretical training of all apprentices on the Copperbelt from the beginning of 1957.

A total of 106,800,000 tons of magnetite iron ore has been indicated to date by diamond drilling on the property of El Sol Gold Mines. The company's property comprises 124 claims and is located in the Papaonga Lake area, about 65 miles north-west of Sioux Lookout, Ontario. Operations of the company are directed by Continental Mining Exploration, formerly Newkirk Mining Corporation.

PERSONAL

Mr. L. K. Brindley, deputy chairman of the Mond Nickel Co. and of Henry Wiggin and Co. Ltd., and Mr. A. Parker Hague, a director of the two companies, have relinquished their appointments effective February 28, 1957.

*

Dr. Ernst C. Hohl and Mr. Marcel Messiqua have joined the board of the Pena Copper Mines.

*

Mr. David Conklin, director of sales of Du Ponts' petroleum chemicals division, has been appointed managing director of the Du Pont Co. (United Kingdom).

*

Mr. E. S. Little, Comp.I.E.E., F.I.A.C., has been reappointed a director of The British Thomson-Houston Co. Ltd. on relinquishing his offices of comptroller and secretary. He will be succeeded as comptroller by Mr. A. D. Gregory and as Secretary by Mr. A. E. Wilson.

*

Mr. R. Turner, chief engineer of Powell Duffryn Technical Services Ltd., has been appointed to the board of that company in place of Mr. G. W. Alexander, chief engineer of Powell Duffryn Ltd.

*

Mr. R. B. Dummett has been appointed a director of The British Petroleum Co., Ltd., to fill the vacancy on the board caused by the resignation of Mr. B. R. Jackson. Mr. D. Anderson, Mr. A. E. C. Drake and Mr. C. E. Spearing Trading Ltd., the company's principal trading subsidiary. Mr. P. T. Cox has been appointed managing director of BP Exploration Co. Ltd.

*

Mr. A. H. Shoemaker, general manager of the Homestake Mining Co., U.S., will be chairman of the national programme committee for the 1957 Metal Mining and Industrial Minerals Convention of the American Mining Congress. The Congress is to be held at Salt Lake City, September 9 to 11, 1957.

*

A one-day conference devoted exclusively to the problems of export advertising is to be held at Church House, London, on March 20.

*

It is anticipated that 500 travelling delegates from all parts of the world will arrive at Vancouver, B.C., on September 8, 1957, to attend the Sixth Commonwealth Mining and Metallurgical Congress. They will travel across Canada by planes and trains on a schedule calling for the final meeting at Halifax, N.S., on October 9. Enquiries should be addressed to Mr. C. C. Huston, Chairman, Publicity and Information Committee, Sixth Commonwealth Mining and Metallurgical Congress, 2001-80 Richmond Street West, Toronto, Ontario, or to the Executive Secretary at 507-837 W. Hastings Street, Vancouver 1, B.C., or to the Secretary of the Institution of Mining and Metallurgy in London.

*

The Physical Society will hold its 41st Exhibition of Scientific Instruments and Apparatus at the Royal Horticultural Society's Old and New Halls, Westminster, from March 25-28, 1957.

CONTRACTS AND TENDERS

Turkey

It is understood that the I.C.A. has recently announced the future authorization for construction, mining and conveying equipment for Turkey. The U.K., along with other O.E.E.C. countries has been designated as a possible source of procurement. Contract period is 6/2/57 to 31/7/57, terminal delivery date 31/7/58, and amount U.S. $130,000. The authorization may not be used for the procurement of specialized oil well drilling and refining equipment. Ref.: E.S.B./4854/57/I.C.A. Enquiries to Chancery 4411, extension 360.

Also for Turkey, P.A. 77-99-H8-7214, construction, mining and conveying equipment. Contract period 8/2/57-31/7/57, terminal delivery date 31/7/58, amount U.S. $372,000. Ref.: E.S.B./5297/57/I.C.A. Enquiries to Chancery 4411, extension 360.

Formosa (Taiwan)

Eleven items including electric motors, control panels, air compressor and well drilling equipment, I.C.A. procurement for Formosa (Taiwan). Issuing authority and address to which bids should be sent Central Trust of China, Purchasing Department, 68 Yen Ping Road, Taipei, Taiwan. Closing date March 25, 1957. Ref.: E.S.B./4761/57/I.C.A. Enquiries to Chancery 4411, extension 360.

Pakistan

The I.C.A. announces the following procurement for Pakistan. Four mine hoists of different types, as well as rails, pulleys, switches, fans, drills, ropes, dump trucks, tractor, electric charging equipment, boring rig, comprising 26 items. Project implementation order 91/21/066/9/60482. Pakistan Industrial Develpment Corporation. Closing date, March 15, 1957. Ref.: E.S.B./4775/57/I.C.A. Enquiries to Chancery 4411, extension 360.

India

The I.C.A. announces the following procurement for India. Two units, diesel motor-driven dragline walking and/or crawler type capable of digging with a 5 to 6 cu. yd. medium dragline bucket using a boom of a minimum length of 135 ft. Closing date, March 29, 1957. Ref.: E.S.B./5081/57/I.C.A. Enquiries to Chancery 4411, extension 360.

Machinery and Equipment

A New Type of Powder Classifier

In the field of dry classification, or the division of powdered materials into fractions according to particle size, there are three factors of vital interest to the chemical, minerals, metals and other industries. These are cutpoint—the particle size about which the powder is divided; product recovery (yield)—that portion of the product available in the feed which is separated by the classifier. The efficiency of the classifier will determine the degree of product recovery; and capacity—the rated throughput.

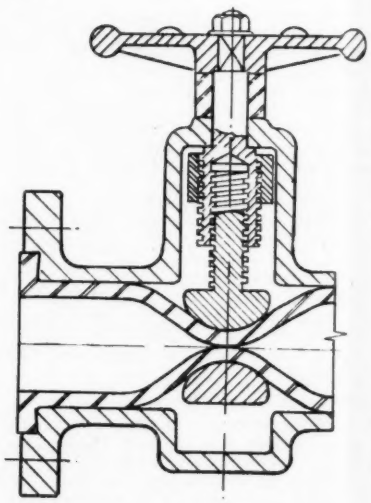
The cutpoint of the new Super Classifier manufactured by Sharples Centrifuges Ltd. is exceedingly precise. For example, fine fractions with a top size in the range of 15-20 microns will contain less than 0.01-0.04 per cent 325 mesh screen residue. Cutpoint sharpness is not affected by throughput rate or size distribution of the feed. Product recovery, or yield, of the Super Classifier varies from 80 per cent to well over 90 per cent, depending upon product requirements. Production runs on talc have been made with over 97 per cent yield at a top size cutpoint of about 15 microns. As with cutpoint, the efficiency of the Super Classifier is not affected by changes in throughput rate or size distribution of the feed. Because cut-point and efficiency of the Super Classifier are not affected by the feed rate or distribution, high production capacities combined with high quality product are easily maintained.

In air vortex classification, air enters a centrifugal chamber from the outside diameter and follows a spiral or vortex path until it is discharged through an opening nearer the centre of the chamber. The Sharples Super Classifier comes closest to achieving the ideal conditions of the air vortex principle, because the powder is brought up to the speed of the air vortex before it is fed into the classification zone. This is of prime importance because it can take over 100 feet of travel for particles in the size range of interest to be brought up to speed by air velocity alone, during which time they are very likely to be incorrectly classified. Also, a constant velocity profile throughout the classification zone. Top and bottom plates of the classification zone rotate at the same velocity as the air, largely eliminating frictional effects. Finally a constant cutpoint throughout the classification zone. Converging, specially shaped plates increase air velocity as air progresses from outside to inside. This maintains a constant relationship between centrifugal force and drag force.

In operation, the powdered material from a mill is fed into the classifier from a vibratory feeder. The fines fraction is carried into a collector by the air stream induced by a blower. The coarse discharge from the Super Classifier is either returned to the grinding mill or used as product. For inert gas operation the clean gas discharge from the blower is returned to the Super Classifier.

VALVES TO RESIST CORROSIVE FORCES

A full bore, straight through, abrasion and corrosion resisting flanged type valve now under production by Wilkinson Rubber Linatex Ltd. is designated the Linatex Mark 2. The valve is designed to perform all the requirements of the control of abrasive and corrosive slurries, chemicals and vapours. The manufacturers state that the components are few in number, comprising a high grade cast aluminium body and handwheel, as well as brass and gunmetal working parts. The slurries, chemicals or vapours are channelled straight through in a Linatex tube, or, where chemical conditions dictate, in suitable synthetic tubes.



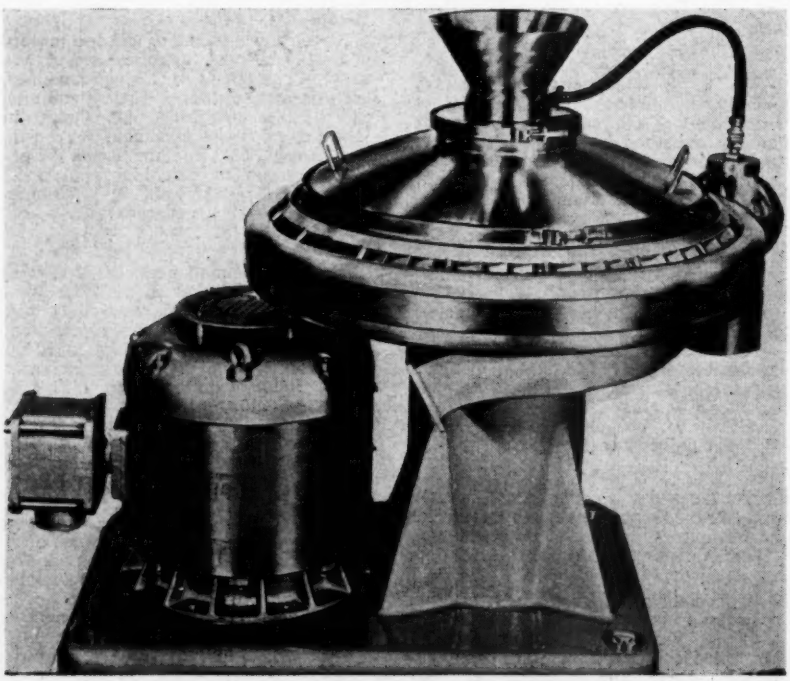
Sizes of these valves range from ½ in. to 10 in., the specific installation naturally depending on the nature and temperature of the slurry, chemical or vapour to be handled and the pressure at which the valves are required to operate.

In keeping with the size range, flange diameters grade from 3¼ in. for the ½ in. valve up to 16 in. for the 10 in. model. Bolt diameters range from ½ in. to ¾ in. and the models weigh approximately from 2½ lbs. to 368 lbs.

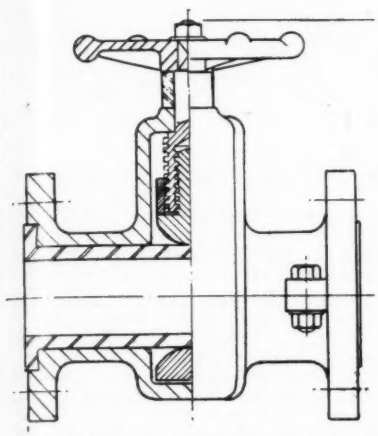
THE SLANT ON VERTICAL DRILLING

New techniques that make the drilling for oil at an angle as accurate as direct downwards movement are being effectively harnessed to develop the oil resources in the tidelands of California. Drilling on the slant has been practised for several years, but the new techniques make it more economical as well.

The key to the new techniques is an up to 10,000 ft. drilling pipe that is as flexible as rubber, bending and curving to go around corners. This device employs what is known as the whipstock, a



Opposite is shown the Sharples Super Classifier, while above on this page is the Linatex Valve Mark 2 in the closed position. The illustration at the top of the opposite page shows the valve open, revealing the straight through flow in either direction



length of steel shaped like a trough. The whipstock comes in lengths of about 9 ft., with a 2½ to 3 deg. angle built into it.

Whenever the driller wishes to introduce a slant into his vertical hole, he attaches a whipstock, which permits the bit to move in a slanting direction. For every 100 ft. drilled, the whipstock permits a deviation of 2½ to 3 ft. from the vertical.

The angle of the whipstock can be varied, according to the extent of slant desired. Then when the oil deposit is reached, drilling can be continued straight down to tap it. This technique can be applied up to drilling distances of about 10,000 ft.

The successful use of a rotary drill rig, common in oil fields but rare in mining areas, to explore an ore deposit 2,000 ft. below the earth's surface is described in a U.S. Bureau of Mines' technical report released by the Department of the Interior.

The Eureka Corporation decided to use such equipment on its property at Eureka, Nevada, because the softness and friability of a zinc-lead-silver-gold formation made it impossible to obtain core samples by diamond drilling, the report explains.

Complete control over the direction of the drill was accomplished by using a whipstock and directional surveying instruments. This, the report notes, made it possible to obtain ore samples from any specified point within a 200-ft. radius of the bottom of the original single hole without starting new holes from the surface.

BREAKING MINED ROCK

The present range of single toggle breakers and granulators, manufactured by Hadfields Ltd., comprises breakers made in fine sizes as well as granulators intended for further reduction in rock sizes. The breakers are for the production of the coarser grade of stone and outputs, based on crushing hard limestone to 2½ in. ring, range from 3 tons to 15 tons per hr. Based on the reduction of hard limestone to approximately ¼ in. cube, the output of the granulators ranges from 3 tons to 10 tons per hr. The machines are manufactured of cast steel with all wearing parts being constructed of Era manganese steel.

The Hadfield single toggle breaker and granulator is illustrated in detail. The more salient components include the jaw stock (6) carrying the swinging jaw (12) and pivoted on an eccentric shaft (5) carried in bearings forming part of the main frame (1). The elliptical crushing movement is modified and controlled by the single toggle plate (17).

Adjustment for size of product is simply effected by raising or lowering the wedge (20) by means of the adjusting bolts (21). This action alters the position of the toggle block (18), resulting in a corresponding variation of distance between the fixed and moving crushing jaws (11 and 12). It is necessary that the flywheels should revolve in one direction, i.e. downward towards the crushing opening.

NEW RANGE OF A.C. MOTORS

In line with the draft B.S. CW(ELE) 6246, and in anticipation of an amendment to B.S. 2613 which is to appear shortly, Crompton Parkinson Ltd. have developed and commenced production of an entirely new range of standard, ventilated type a.c. squirrel-cage, 3-phase motors. They are to be known as the C.P. Series 5 machines, and the complete range—1 h.p., 4-pole up to 50 h.p., 2-pole—has already been made available from January 1.

In designing the new motors, C.P. have exploited what is now the permissible use of Class E insulation which allows for motor operation at continuous maximum ratings with a temperature rise of 65 deg. C. This fact, coupled with the development of an improved cooling system, has enabled the size and weight of a motor having a particular h.p. rating to be considerably reduced and, also, the form of standard protective enclosure to be appreciably improved. Indeed, compared with the machines they supersede, Series 5 machines may be as much as 40 per cent lighter in weight and may take up only 60 per cent of the space.

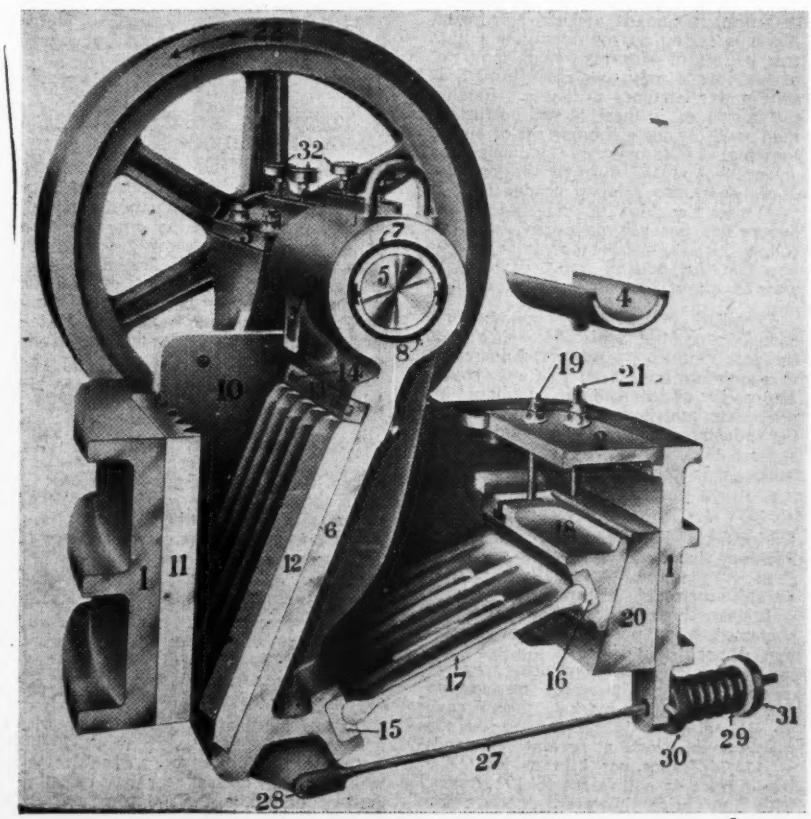
The new motors, suitable for all types of equipment, have the same main dimensions as those laid down for equivalent N.E.M.A. frames, except that the new British machines have shafts of slightly larger diameter to cater for the larger outputs developed in the same frame sizes.

ELECTRODES IN MINE WORKSHOPS

The electrolode holder supplied by Eutalloy and Welding Processes Ltd., is designed to meet the conditions appertaining in mine workshops and has a definite application to those mining companies operating overseas.

The equipment comprises a renewable head, sliding fit bronze current contacts, a hexagonal bronze cable holder, pressure spring, ventilated handle and the cable, and is completely insulated in accordance with B.S.S. regulations. A quarter turn secures the electrodes by a positive vice grip of 1,000 lbs., while in addition there is instant electrode change and all the electrode is used.

A single toggle breaker showing: 1, Frame; 2, Bridge Plate; 3, Frame Bearing Caps; 4, Castings for Frame Bearings; 5, Eccentric Shaft; 6, Swing Stock; 7, Top half Swing Stock Casing; 8, Bottom half Swing Stock Casing; 9, Cotter Bolts; 10, Cheek Plates; 11, Fixed Jaw; 12, Swing Jaw; 13, Packing Wedge; 14, Bolts for Packing Wedge; 15, Toggle Cushion; 16, Toggle Cushion; 17, Toggle Plate; 18, Toggle Block; 19, Bolts for Toggle Block; 20, Adjusting Wedge; 21, Bolts for Adjusting Wedge; 22, Fly-wheel Plain; 24, Fly-wheel Pulley; 27, Draw-back Rod; 28, Pin for Draw-back Rod; 29, Spiral Spring; 30, Spring Washer; 31, Spring Washer; 32, Stauffer Lubricators



Metals and Minerals

Whither Aluminium Prices?

Earlier this year Alcan predicted that supplies of aluminium would be in near balance with demand over 1957 as a whole. It is evident that the outlook for the current year must to some extent have been affected by the low level of activity in the American and European motor industries and a surplus now appears to be in sight, though it seems likely to be a small one, having regard to the current restriction of production in the U.S. and Canada owing to shortages of hydro-electric power. Metal users are accordingly wondering whether aluminium prices will start weakening as the surplus develops.

In the U.S. the prices of the softer aluminium alloy extrusions were recently cut by leading producers by amounts averaging about 6 per cent. This action on the part of major fabricators is regarded as an attempt to bring about a more stabilized pricing structure for extruded shapes, but there is no indication that the reduction in mill prices for extruded products is the forerunner of a downward revision in prices of other products, particularly pig and ingot.

It is pointed out that stocks are not yet out of hand, and that any pronounced upward movement in demand during the next few months could rapidly deplete present inventories. Moreover, apart from the temporary curtailment of output in Canada and the Northwest, Alcoa is taking out of operation a high cost potline at Massena, which may not be put into commission again until Seaway power becomes available. Finally, the stock level in the U.S. will be further held down by the siphoning off of 40,000 tons out of commercial channels into government stocks through the exercise of rights by two primary producers. The fact that the third of the major producers has not yet made any move to follow this example is taken as an indication that the industry is not particularly worried about the supply position.

Canadian prices have remained unchanged since last September, while over the year 1956 as a whole, price increases in aluminium have been relatively small. The policy of the leading Canadian suppliers has contributed to the stability of the industry and there is no evidence to suggest that any downward revision of prices is, in fact, contemplated.

★

Monsieur H. Paton, chairman of Péchiney, has declared that the six European "common market" countries should surround themselves with a sufficiently high customs barrier to be protected from possible foreign dumping. He said that his company, the leading French aluminium producer, was in a good position to meet competition within the common market. The French aluminium price is claimed to be the lowest in the world at present. It stands at 174.26 francs per kilo, whereas the world price is equivalent to 193 francs. This low price, however, deprives the company of revenue required for its investment programme.

Among the projects included in Péchiney's huge investment programme are the "Alucam" aluminium plants in the Cameroons, which will produce 10,000 tons of aluminium this year and by the middle of 1958 will reach an annual capacity level of 45,000 tons; the "Fria Compagnie Internationale Pour la Production d'Alumine" recently set up by Péchiney-Ugine with Olin Mathieson, the British Aluminium Co., and AIAG; and the Souapiti aluminium project on the Konkoure River, which will be carried out if the dam costs are sufficiently low to supply power at world prices.

★

Aluminium Ltd. has decided to invest a total of 35,000,000,000 francs in a bauxite and alumina project in French Guinea. Through its French subsidiary, Bauxite du Midi, the company plans to build a plant there with an annual productive capacity of 220,000 tons of alumina, and to mine 1,500 000 tons of bauxite a year. The project will involve the building of a 120 kilometre railway from Boke to the sea, and of a loading port at the estuary of the Rio Nunez.

★

In view of rising demands for electric power, Japan has revised its 1957 (fiscal) aluminium production target downwards to 76,071 tonnes of primary metal, which is some 3,729 tonnes below the programme previously announced.

IS LITHIUM'S ROLE IN FUSION EXAGGERATED?

The suggestion that more importance than the immediate situation justified was being attached to the supposed need for an isotope of lithium in the fusion reactor, was made by Mr. Joseph L. Gillson, chief geologist for E. I. du Pont de Nemours, in a paper presented before the American Institute of Mining, Metallurgical and Petroleum Engineers.

Mr. Gillson noted that the industrial uses for lithuim compounds are in greases, ceramics and glass, aluminium welding, air-conditioning, and in the alkaline storage battery. In the U.S., military and atomic energy uses are expected to take only about 17 per cent of the requirements both in 1956 and 1960. Hence these applications are not, and will not soon be, an important factor in the demand.

Possibly the biggest potential is in new uses for lithium metal which has the remarkabe property of remaining liquid over a very wide range of temperature, from 186 deg. to 1.336 deg. C. However, this property is also shared by the much cheaper similar metal, sodium.

Six milling plants in North America now have a capacity of about 12,000 s. tons of lithium carbonate equivalent, while the demand last year may be estimated at only about 5,500 tons and the 1960 estimated demand is probably less than 8,000 tons.

While decrying the tendency to glamorize the future possibilities of lithium, Mr. Gillson said nothing to suggest any lack of confidence in the metal's long-term prospects as an industrial material, nor do his observations appear to rule out the possibility of a major outlet in fusion reactors at a future date. He did, however, tend to decry the "rushing into production" of lithium mines in the U.S., Canada and Rhodesia, when "there is now a substantial amount of excess capacity."

SILVER MOVES WESTWARDS

In their latest annual Bullion Review, Samuel Montagu and Co. point out that the central feature of 1956 was the substantial flow of Bar Silver to the United States. The greater part of these shipments—67,816,979 oz.—came from this country and represented the largest annual movement of silver from United Kingdom westwards since 1938. In so far as the Soviet Union was concerned there was the almost complete cessation of sales to London as compared with about 9,000,000 oz. in each of the two previous years.

Of the silver to be repaid to the United States under Lend-Lease the Review reminds that the Board of Trade returns show that by the end of 1956, 67,816,979 oz. out of a total liability 88,073,878 oz. had already been shipped. Further, it is thought that the Bank of England's silver stocks increased last year by about 13,000,000 oz. and, as the authorities apparently made no official purchases in the market, sufficient stocks are on hand to complete the repayment of the lend-lease obligations by the due date, April, 1957. The Netherlands shipped a further 19,641,146 oz. during 1956 leaving a total outstanding of about 7,900,000 oz. Australia is believed to have repaid about 10,000,000 oz. out of a total liability of 11,800,000 oz. No information is given as to the plans of India, Pakistan, Saudi Arabia, Ethiopia and the Fiji Islands for meeting their commitments.

WOLFRAM'S PRICE SLIDE

Demand for wolfram is still of a patchy nature. With plenty of material reported to be available, buyers are only operating on a hand-to-mouth basis. Under present conditions they are not prepared to buy forward and will only enter into deals if the ore is near at hand or on the spot. Prices have fallen by nearly 100s. since they started to move lower in mid-1956. They are now getting within striking distance of 140s. to 150s., the level below which—according to some authorities—it would be generally uneconomic to produce. If the present downward trend remains unbroken, however, it is quite con-

ceivable that prices might dip below that level for the time being, under the weight of accumulated supplies. Possibly up to about six months might have to elapse before the very low price automatically remedied the position.

TURKEY'S CHROME EXPORTS

According to Press reports, Turkey's exports of chrome ore in 1956 amounted to about 760,000 tonnes, of which 160,000 tonnes were handled by the Eti Bank. The remainder was exported by the "Chrome Committee" set up by private chrome mine owners.

Chrome ore deposits said to cover an area of about 15 square miles have been located in Southern Rhodesia in the Belingwe Reserves, not far from the Lourenco Marques line.

MORE EXPANSION GOALS REACHED

The Office of Defence Mobilization in the U.S. has announced the closing of expansion goals for chemical grade chromite, selenium, and battery and chemical grade manganese ore. It was further stated that rapid tax amortization had not served as a "suitable incentive" to cause these industries to expand as much as mobilization planners desired. No applications had been received for years. Consideration would therefore be given to developing other expansion programmes.

COPPER · TIN · LEAD · ZINC

(From our London Metal Exchange Correspondent)

The overall picture has shown little change during the last week and prices have remained steady owing to a combination of slightly more enquiry and slightly less selling pressure. Some quarters expect that if prices can be stabilized for a short while longer buyers will come in to rebuild their stocks which are known to be getting low: it is not expected, however, that a buying movement will result in a very much higher price as it is known that producers have not been selling the whole of their intakes during recent weeks.

COPPER STEADIES AT £240+

On the London Metal Exchange the copper market has maintained its recent activity but with practically no alteration in either the price level or the amount of the backwardation, and stocks at the beginning of the week were practically unaltered being only 14 tons lower at 3,263 tons. In Europe, slightly more interest has been shown by consumers but with a holiday in Germany at the beginning of the week the demand has shown no appreciable increase.

In America business seems to be a little bit better with fair tonnages moving at both 31 c. per lb. and 32 c. per lb. and scrap prices have been slightly firmer.

On Tuesday, the United States Government announced the suspension until the end of June of export quotas for copper scrap and copper base alloy scrap and a number of views have been expressed on the likely results of this action—with, as yet, little unanimity.

In the writer's view, assuming that no great disparities reappear in the copper prices in various parts of the world, this action will allow Western Germany to obtain more metal from the States during those periods when the Japanese are not anxious buyers. It seems very doubtful whether there is sufficient scrap available for export to cause any real movement in price levels elsewhere.

Discussion continues on the need for the major producers to institute some cut-backs in production to balance the supply and demand picture and some experts consider that the curtailment necessary would have to be in the neighbourhood of 20,000 tons a month. (This, presumably, presupposes no stockpile offtake under floor price contracts.)

In the Congo the tonnage of copper exported in 1956 amounted to 253,936 tons against the figure for 1955 of 230,770 tons, which is a further proof—if one is necessary—of the increasing world output. Pointing in the same direction is this week's statement from the Quebec Department of Mines that the Chibougamou copper camp may turn out some 100,000 s.tons of copper annually in the next two or three years. Present operators in Quebec are producing some 37,500 s.tons annually.

Sir Ronald Prain made known an interesting fact recently, namely, that the Rhodesian Copperbelt average reserve grade is 3.59 per cent against a world average reserve grade of 1.79 per cent.

MARKET AWAITS BOLIVIAN TIN FROM U.K. SMELTERS

Stocks of tin in London Metal Exchange warehouses on Monday showed a further fall of 125 tons, giving a total of only 363 tons, which is the lowest figure for a long time. Although the price level has not fluctuated much the backwardation has increased and it is hoped that additional supplies from the U.K. smelters will soon become available.

The strike at Penang is beginning to have some effect on shipments of metal from Malaya and the February export figures show a decline from 6,070 tons to 4,831 tons but the pattern of exports has remained fairly steady, a little under half the total going to the United States and the main recipients of the balance being Europe, India and South America.

On the Continent business remains satisfactory but it would appear that selling pressure is gradually building up from the Dutch smelter now that additional tonnages of Indonesian concentrates have reached the plant. In the United States demand has been better than of late, but as imports appear to have been little hindered by the recent dock strike and continuing tug boat strike in New York, prices have shown little alterations. On Thursday morning the Eastern price was equivalent to £766¼ per ton c.i.f. Europe.

LEAD "BACK" MAY DISAPPEAR

The turnover on the London lead market has again been small, but the undertone has been firm; backwardation has been reduced almost to nothing. It is expected that there will be plenty of metal available in the country now that the Government disposal both to the trade and to the producers' agents has been completed and it is possible that the backwardation may disappear altogether.

Demand on the Continent and in the United States has remained of a routine nature and nowhere is there any talk of alteration in the general price level. An indication of how demand is keeping up is provided by the fact that replacement batteries delivered in the United States in January attained the third highest total since November, 1955, at a figure of approximately 2,600,000 units. During the week there has been a short strike at the Rhodesia Broken Hill Mine, but this had no effect on the market.

The final figures for lead production during 1956 in the O.E.E.C. producer countries showed that the increase over 1955 was only about 38,000 tons at 563,088 tons. Increases took place in Belgium, Germany, Sweden and the U.K. whilst the main reductions were in France and Italy.

EUROPE'S HIGH-GRADE ZINC USAGE RISING

In London the zinc market also has shown little activity although the undertone is probably firmer due partly to the fact that it is now known that during January barter bills in the United States included zinc to the value of some $1,200,000. It has also become known that Japanese production is temporarily below domestic needs and Australian concentrates have been bought for delivery during May and June. The tonnage involved is said to be a little over 20,000 tons of concentrates.

The final figures for zinc production during 1956 in the O.E.E.C. producer countries showed that the increase over 1955 was about 50,000 tons at 815,935 tons.

It is interesting to note, however, that the relatives increase in the productions of high-grade zinc and G.O.B. zinc were 40,000 tons and 10,000 tons respectively and it is considered that during the current year the ratio of the production of the two grades will swing further in favour of high-grade zinc.

During 1956 the U.S. remained a large net importer of zinc with actual imports at 244,974 tons being about 50,000 tons above the previous year's figure and exports amounting to only 8,815 tons being about 9,000 tons lower than 1955.

Closing prices and turnovers are given in the table overleaf:—

LONDON METAL AND ORE PRICES, MARCH 7, 1957

THE WEEK ON THE L.M.E.

	February 28 Buyers	February 28 Sellers	March 7 Buyers	March 7 Sellers
Copper				
Cash	£244½	£245	£241	£241½
Three months	£243	£243½	£239½	£240
Settlement	£245		£241½	
Week's turnover	7,675 tons		5,650 tons	
Lead				
Current ½ month	£112½	£112½	£113½	£114
Three months	£111½	£112	£112½	£113
Week's turnover	2,425 tons		3,975 tons	
Tin				
Cash	£757	£759	£764	£765
Three months	£744	£745	£747	£748
Settlement	£759		£765	
Week's turnover	805 tons		740 tons	
Zinc				
Current ½ month	£96½	£97½	£98	£98½
Three months	£95½	£95½	£95½	£96
Week's turnover	4,675 tons		3,400 tons	

METAL PRICES

Aluminium, 99.5%, £197 per ton

Antimony —
English (99%) delivered, 10 cwt. and over £210 per ton
Crude (70%) £200 per ton
Ore (60%) bases 23s. 6d./24s. 6d. nom. per unit, c.i.f.

Arsenic, £400 per ton

Bismuth (min. 1 ton lots) 16s. lb. nom.

Cadmium 12s. 0d. lb.

Cerium (99% nett), £13 18s. lb. delivered U.K.

Chromium, 7s. 2d. lb.

Cobalt, 16s.-19s. lb.

ORES AND OXIDES

Bismuth .. .. 50% 5s. 0d. lb. c.i.f. 20% 3s. 3d. lb. c.i.f.

Chrome Ore—
Rhodesian Metallurgical (semifriable) 48% .. .. £17 8s. 0d. per ton c.i.f.
,, Hard Lumpy (45%) .. .. £17 8s. 0d. per ton c.i.f.
,, Refractory 40% .. .. £12 15s. 0d. per ton c.i.f.
,, Smalls 42% .. .. £16 5s. 0d. per ton c.i.f.
Baluchistan .. .. £18 15s. 0d. per ton c.i.f.

Columbite, 65% combined oxides, high grade .. .. 185s./197s. 6d. per unit

Fluorspar—
Acid Grade, Flotated Material .. .. £22 13s. 3d. per ton ex. works
Metallurgical (75/80% CaF_2) .. .. 156s. 0d. ex. works

Lithium Ore—
Petalite min. 3½% Li_2O .. .. £8-£10 per ton f.o.b. Beira
Lepidolite min. 3½% Li_2O .. .. £8-£10 per ton f.o.b. Beira
Amblygonite basis 7% Li_2O .. .. £28-£32 per ton f.o.b. Beira

Magnesite, ground calcined .. .. £28 0s./£30 0s. d/d
Magnesite Raw (ground) .. .. £21 0s./£22 0s. d/d
Molybdenite (85% basis) .. .. 8s. 5d. nom. per lb. (f.o.b.)

Titanium Ore —
Rutile 95/97% TiO_2 .. .. £68/£70 per ton c.i.f. Aust'n
Ilmenite 52/54% TiO_2 .. .. £11 per ton c.i.f. Malayan

Wolfram and Scheelite (65%) .. .. 145s./152s. 6d. per unit c.i.f.

Manganese Ore Indian
Europe (46%-48%) basis 155s. freight plus 17½% surcharge .. .. .. 141d.-151d. nom. per unit c.i.f.
Manganese Ore (43%-45%) .. .. 116d. nom. per unit. c.i.f.
Manganese Ore (38%-40%) .. .. 111d. nom. per unit. (including duty)

Vanadium —
Fused oxide 90-95% V_2O_5) .. .. £12½-£13½ per unit c.i.f.
Zircon Sand (Australian) (65-66% ZrO_2) .. .. £20 per ton c.i.f.

Germanium, 99.99%, Ge. kilo lots 3s. 4d. per gram
Gold, 249s. 7½d.
Iridium, £27/29 oz. nom.
Lanthanum (98/99%) 15s. per gram
Manganese Metal (96%-98%) £310
Magnesium, 2s. 5½d. lb.
Nickel, 99.5% (home trade) £600 per ton
Osmium, £20/22 oz. nom.
Osmiridium, nom.

Palladium, £8 0s./£8 10s. oz.
Platinum U.K. and Empire Refined £33/£34 oz.
Imported £33½/£33¾ nom.
Quicksilver, £84½/£85 ex-warehouse
Rhodium, £42 oz.
Ruthenium, £15/£17 oz. nom.
Selenium, 85s. nom. per lb.
Silver, 79½d. f. oz. spot and 79½ f'd.
Tellurium, 15s./16s. lb.

LONDON STOCK EXCHANGE PRICES, MARCH 6, 1957

Finance	Price Mar. 6	+ or — on week
African & European	57/6	.....
Anglo American Corpn.	6½	+⅛
Anglo-French	21/6	—3d
Anglo-Transvaal Cons.	26/3	.....
Central Mining (£1 shrs)	65/-	+2/6
Consolidated G'fields	57/9	+9d
Consol. Mines Selection	29/4½	—7½d
East Rand Consols	1/4½	.....
General Mining	68/9	—1/3
H. E. Prop.	7/9	—3d
Johnnies	41/1½	+4½d
Rand Mines	65/-	.....
Rand Selection	34/4½	.....
Union Corporation	37/3	.....
Vereeniging Estates	5⅛	.....
Writs	36/3	.....
West Wits.	33/9	.....
Rand Gold		
Blyvoors	19/4½	—3d
Brakpan	5/6	.....
Buffelsfontein	33/7½	.....
City Deep	12/10½	+1/4½
Consol. Main Reef	12/4½	+4½d
Crown	28/1½	—1/10½
Daggas	31/10½	+7½d
Dominion Reefs	17/9	—3d
Doornfontein	22/9	+1½d
Durban Deep	22/6	—7½d
E. Champs	3/-	.....
E. Daggas	7/6	—3d
E. Geduld (4s. units)	26/9	+6d
E. Rand Props.	42/3	—3d
Geduld	71/3	.....
Govt. Areas	3/-	+1½d
Grootvlei	16/7½	.....
Hartebeestfontein	47/4½	+1/-
Libanon	7/-	+4½d
Luipaards Vlei	13/9	+1½d
Marievale	16/7½	.....
New Kleinfontein	3/3	+3d
New Pioneer	18/9	+10½d
Randfontein	32/9	+1/6
Robinson Deep	6/9	+3d
Rose Deep	7/9	.....
Simmer & Jack	3/9	.....
S.A. Lands	21/3	—7½d
Springs	2/3	.....
Stilfontein	27/-	—3d
Sub Nigel	17/6	+3d
Vaal Reefs	31/9	.....
Van Dyk	2/3	—1½d
Venterspost	12/3	+3d
Vlakfontein	14/4½	+1½d
Vogelstruisbult	12/7½	+3d
West Driefontein	5½	+⅛

Rand Gold contd.	Price Mar. 6	+ or — on week
W. Rand Consolidated	31/3	+7½d
Western Reefs	28/9	—1½d
O.F.S. Gold		
Freddies	6/9	.....
Freddies Consolidated	3/-	.....
F.S. Geduld	71/3	+1/3
Geoffries	3/-	.....
Harmony	23/-	—3d
Loraine	4/3	—3d
Lydenburg Estates	12/-	—3d
Merriespruit	4/10½	+7½d
Midole Wits	8/3	+6d
Ofsits	52/9	—9d
President Brand	51/3	—1/3
President Steyn	29/6	—6d
St. Helena	26/3	+6d
Virginia Ord.	8/6	.....
Welkom	14/6	.....
Western Holdings	68/1½	—1/3
West African Gold		
Amalgamated Banket	1/3	—¼d
Ariston	3/6	.....
Ashanti	16/1½	+6d
Bibiani	2/1½	.....
Bremang	1/4½	—¼d
Ghana M.R.	1/5½	.....
Konongo	1/4½	.....
Marlu	½d	.....
Taquah	1/1½	.....
Western Selection	6/3	—1½d
Australian Gold		
Gold Mines of Kalgoorlie	13/9	.....
Great Boulder Prop.	12/4½	+1½d
Lake View & Star	18/3	—1½d
Mount Morgan	14/3	—1/3
North Kalgurli	7/6	.....
Sons of Gwalia	1/9	.....
Western Mining	10/3	—6d
Miscellaneous Gold		
Cam & Motor	7/7½	—3d
Champion Reef	14/-	+7½d
Falcon Mines	7/9	+1½d
Globe & Phoenix	23/6	.....
Motapa	1/-	—1½d
Mysore	3/9	+6d
Nundydroog	19/-	+6d
St. John d'el Rey	56/3	—7/6
Zams	49/6	+6d

Diamonds and Platinum	Price Mar. 6	+ or — on week
Anglo American Inv.	8⅛	—⅛
Casts.	25/4½	+3d
Cons. Diam. of S.W.A.	10/10½	.....
De Beers Defd. Regd.	5	+⅛
De Beers Pfd. Regd.	14⅜	—⅛
Pots. Platinum	14/10½	+1½d
Waterval	24/6	—3d
Copper		
Bancroft	42/3	+3d
Chartered	69/6	+2/-
Esperanza	2/9	—1½d
Messina	8¼	+⅛
Nchanga	11 7/16	+⅛
Rhod. Anglo-American	4 11/16	.....
Rhod. Katanga	42/-	+1/6
Rhodesian Selection	21/9	+7½d
Rhokana	36¾	—¼
Rio Tinto	4½	+⅛
Roan Antelope	12/1½	—1½d
Selection Trust	4¼	—⅛
Tanks	7 3/16	+⅛
Tharsis Sulphur Br.	5	.....
Tin (Eastern)		
Ayer Hitam	25/-	—3d
Gopeng	15/1½	+6d
Hongkong	7/4½	—3d
Ipoh	25/-	.....
Kamunting	9/7½	.....
Kepong Dredging	5/3	.....
Kinta Tin Mines	20/9	+3d
Malayan Dredging	14/4½	.....
Pahang	13/7½	—6d
Pengkalen	16/6	.....
Petaling	6/7½	—3d
Rambutan	17/9	.....
Siamese Tin	11/-	—6d
Southern Kinta	16/1½	—3d
S. Malayan	9/10½	—7½d
S. Tronoh	6/7½	.....
Sungei Kinta	19/6	.....
Tekka Taiping	8/6	.....
Tronoh	12/9	.....
Tin (Nigerian and Miscellaneous)		
Amalgamated Tin	9/-	.....
Beralt Tin	37/9	—2/6
Bisichi	4/-	.....
British Tin Inv.	22/-	.....
Ex-Lands Nigeria	2/4½	+1½d
Geevor Tin	20/7½	.....

Tin (Nigerian and Miscellaneous) contd.	Price Mar. 6	+ or — on week
Gold & Base Metal	1/-	.....
Jantar Nigeria	3/-	+4½d
Jos Tin Area	15/-	.....
Kaduna Prospectors	2/-	.....
Kaduna Syndicate	2/1½	.....
London Tin	10/7½	+1½d
United Tin	9d	.....
Silver, Lead, Zinc		
Broken Hill South	72/-	—4/3
Burma Mines	4/3	.....
Consol. Zinc	80/3	—2/9
Lake George	9/9	—3d
Mount Isa	27/6	—2/-
New Broken Hill	51/-	—2/6
North Broken Hill	6 1/16	+¼
Rhodesian Broken Hill	13/-	—1½d
San Francisco Mines	23/9	.....
Uruwira	4/-	—1½d
Miscellaneous Base Metals and Coal		
Amal. Collieries of S.A.	2½	.....
Associated Manganese	36/6	.....
Cape Asbestos	10/9	—3d
C.P. Manganese	24/6	—1/-
Consol. Murchison	48/9	.....
Natal Navigation	3⅛	.....
Turner & Newall	115/9	+3d
Wankie	18/3	.....
Witbank Colliery	5⅛	.....
Canadian Mines		
Dome	$25½	—¼
Hollinger	$49½	—¼
Hudson Bay Mining	$158¼	+5½
International Nickel	$193½	+1
Mining Corpn. of Canada	£6 1/16	+⅛
Noranda	$101	+5
Quemont	£6 1/16	+⅛
Yukon	4/9	+3d
Oil		
Apex	42/-	—6d
Attock	37/9	.....
British Petroleum	146/9	+5/9
Burmah	92/-	+2/-
Canadian Eagle	63/3	.....
Mexican Eagle	22/-	.....
Shell	164/6	—6d
T.P.D.	51/-	+6d
Ultramar	67/4½	+3/3

Mining Finance

The Technical Position at Merriespruit

A considerable amount of speculation has recently surrounded the question of how Merriespruit Gold Mine will obtain the funds necessary to extricate itself from its present water difficulties, and thereafter to permit a resumption of progress towards an economical production rate.

Fears that the company will be burdened with an additional large sum of loan capital have been one of the factors responsible for a drop in the 5s. shares from a high point of 11s. 9d. in 1956 to their present level of no more than par. As the future depends largely upon finding a speedy solution to the critical situation now obtaining at the mine, it is extremely important to be fully conversant with the up-to-date technical position.

Getting baling started at Merriespruit with its shafts flooded to some 600 ft. from the collar presented two major problems. The first arose from the jamming of two shaft conveyances at the 31st level when the disastrous inrush of water took place last November. In order to clear the shafts above these levels the three winding ropes had to be cut. This was done by sliding pear-shaped thermite bombs by means of sinkers down the ropes for a distance of some 3,000 ft. These were ignited by delayed action fuses and the ropes cut. Little difficulty was encountered in getting the severed ropes up to the surface.

The initial plan entails the use of six bailers—four at No. 1 shaft and two at No. 2 shaft. These are rectangular steel buckets, with self-operating valves in the bottom, each with a capacity of about 1,500 gals. Short runs at the start of operations will put a heavy strain on the winders, and additional ventilation of the motors has, therefore, had to be installed.

As the water level drops, the capacity of the balers will be increased to 2,600 gals. each and it is hoped that a rate of 5,000,000 gals. a day will be reached. Present operations are, of course, primarily concerned with finding out what rate of water inflow from the original fissure may be expected once the equalizing pressure has been reduced.

It has been asked why straightforward pumping is not being used from the start. In this connection it must be realized that the only water in the upper reaches of the mine are contained in the two shafts. In consequence, the actual amount of water is relatively small in terms of head. If the amount of water can be reduced by means of baling to, say, 2,000 ft. below the collar with six balers and held there by four balers, it should be possible to cut a station at this point and install pumping capacity great enough to allow of an attempt being made to seal off the fissures.

Parallel with baling operations, a close watch is being kept on the water table, in the adjoining Virginia Mine. For in the case of any appreciable change of water level at the latter property, it may be possible to step up pumping capacity and thus provide considerable assistance to Merriespruit.

Provision has also had to be made for disposing of the water from baling. Like all other Free State mines, underground water at Merriespruit is highly mineralized and cannot be run into surface streams and rivers. The only method of dealing with it at present is by evaporation in large pans.

SHARP RALLY ON WALL STREET

Good news regarding the Middle Eastern situation played a prominent part in touching off the sharp rally which took place on Wall Street during the past week. In London sentiment also reflected this factor and was assisted by a fall in the Treasury Bill Rate to its lowest level for nineteen months. February gold and dollar figures had little effect on prices.

Index	*Feb. 28*	*March 6*
Dow Jones Ind. ...	464.62	474.87
F.T. Ind. Ord. ...	188.7	189.8
F.T. Gold ...	73.0	73.0

Amongst Kaffirs some of the older mines which stand to benefit from concessions in the impending South African budget went better on Continental buying. Gold mining returns for February were good but reflected the short month and a lower gold price at 248s. 9d. per oz. against 249s. in January. A statement by Mr. Naude, S.A. Minister of Finance, that support for an increased gold price was growing raised hopes. (See page 309 for February gold returns.)

Figures in respect of Transvaal and O.F.S. gold and uranium producers for 1956 are now available and the table below shows a breakdown into Rand, Klerksdorp and O.F.S. Progress by O.F.S. companies was particularly encouraging, especially in respect of tonnage milled which rose by 30 per cent over the previous year's figure.

Diamonds, platinums and tins were all largely unchanged. But Rhodesian coppers showed a general improvement.

OFSIT'S OPTIONS EXTENDED

An important talking point in mining markets over the past few weeks has been whether the 5s. shares of Orange Free State Investment Trust would rise to 60s. at which level large option conversions were valid until June 30, 1957, or failing that, whether the option dates would be extended.

In the event, the decision to extend was taken, and this naturally caused a measure of disappointment. Ofsit's shares, which at one time had reached nearly 55s., thus receded again to around 52s. This compares with a low of 47s. 6d. and high point of 65s. 3d. during 1956-57.

The decision arose as the result of representations made to the company by and on behalf of bond holders in Switzerland, and holders of sterling notes, and it was because of the exceptional circumstances which arose from Orange Free State gold mines in general having been unable to commence production on schedule, that these representations were met.

The issues affected were the £1,771,262 5 per cent Registered Unsecured Convertible Notes, which were convertible into shares up to June 30, 1957, at the rate of one 10s. share for each £3 of notes. In addition, holders of £2,040,816 4½ per cent Registered Bonds (Swiss Loan) also had the right up to the same date to subscribe for 27 Ofsit shares in respect of each Registered Bond of 1,000 Swiss francs at a price of £3 per share, or alternatively, to convert into ordinary shares at the rate of 27 shares plus a cash payment of 12s. 7d. in respect of each bond of 1,000 Swiss francs. Both

TRANSVAAL AND O.F.S. GOLD AND URANIUM PRODUCERS

Comparison and analysis of salient results for calendar years 1956 and 1955

Heading			*Jan. to Dec.*	*Rand Cos.*	*Klerksdorp Cos.*	*O.F.S. Cos.*	*Total*
Tons milled :	Millions		1956	54·0	4·1	9·4	67·5
			1955	55·8	3·1	7·2	66·1
Ounces produced :	Millions		1956	10·9	1·3	3·2	15·4
			1955	11·0	0·9	2·2	14·1
Grade per ton :	Dwt.		1956	4·02	6·56	6·73	4·55
			1955	3·95	5·79	6·08	4·27
Working costs per ton:	s. d.		1956	40/5	50/11	53/5	42/11
			1955	38/8	45/8	51/2	40/4
Working Profits :	Gold	£m	1956	28·1	6·4	14·8	49·3
			1955	31·2	4·2	9·1	44·5
Working Profits :	Uranium	£m	1956	15·8	4·4	4·5	24·7
			1955	13·0	2·6	1·9	17·5
Total Profits :		£m	1956	43·9	10·8	19·3	74·0
			1955	44·2	6·8	11·0	62·0
Dividends declared (net total)		£m	1956	19·1	3·4	5·7	28·2
			1955	19·2	1·7	1·5	22·4
Non-European employees at end-Dec.			1956	228,000	26,000	54,000	308,000
			1955	228,000	20,000	50,000	298,000
Number of Cos. included			1956	40	5	11	56
			1955	40	4	9	53

of these issues have had their dates extended until June 30, 1958.

Besides this, the Anglo American Corporation of South Africa, together with De Beers Investment Trust, had the right to subscribe for 625,000 shares at 80s. per share up to December 31, 1957. This has been extended by one year to December 31, 1958. As the proceeds from the exercise of these rights would have been applied in repayment of drawings against loan facilities of £2,500,000 granted to Ofsit by the two companies, the date of repayment for the loan has also been extended by one year to March 31, 1959.

Financial News and Results

S.R. Steel Denationalization.—It will be recalled that the expansion of Commonwealth steel production was discussed in our issue of February 8, 1957 (p. 178). It is now learned that a scheme has been prepared for denationalizing the iron and steel industry in Southern Rhodesia. This entails the formation of a new company to take over the assets of the Rhodesian Iron and Steel Commission. An £8,000,000 development programme will then be undertaken under which steel production will be raised from 50,000 tons a year to 150,000 tons a year, in addition to which 500 to 600 tons of pig iron will be produced weekly. Subscribing for cash at par in the equity of the new company will be: Lancashire Steel, Stewarts and Lloyds, Messina (Transvaal), Anglo American Corporation, British South Africa Co. and Tanganyika Concessions.

Gold Fields and S.W.A. Co.—New Consolidated Gold Fields has circulated an official offer on behalf of itself, the Anglo American Corporation of South Africa and the British South Africa Company, to purchase two out of every three shares in the South West Africa Company at £5 per share. The reason for this partial offer is that the purchasers propose that the S.W.A. Co. shall undertake a vigorous campaign of exploration and development, and they consider, therefore, that present shareholders may wish to retain an interest. Any further shares which holders may wish to offer will, however, be acquired at the same price by the purchasers.

"Chartered's" Investments.—Consolidated balance sheet figures of The British South Africa Company at September 30, 1956, revealed the market value of quoted investments at £33,725,774 against £33,220,173 at the end of the previous year. The book value of these holdings increased to £16,689,194 from £15,451,030. Current assets exceeded current liabilities by nearly £3,000,000. During its past financial year "Chartered" made net profits after tax of £7,010,450 (£5,647,267). Mr. C. Hely-Hutchinson is president. Meeting, London, March 28.

"C.M.S." in 1956.—Quoted investments of The Consolidated Mines Selection Company at December 31, 1956, had a market value of £4,213,040 (£4,701,341). These holdings were shown at a book value of £1,850,302 against £1,925,173. During its past financial year C.M.S. made net profits after taxation of £156,823 (£164,478). Mr. A. C. Wilson is chairman. Meeting, London, March 26.

African and European Pays More.—African and European Investment Company has raised its ordinary dividend to 32½ per cent from 25 per cent previously. Profit, after taxation, for the year ended December 31, 1956, was £1,156,733 compared with £820,476.

Need for Malayan Prospecting.—In his statement to shareholders of British Tin Investment Corporation the chairman, Mr. S. H. Smith, referred to reports that a number of Malayan tin companies were having to cease operations by some of their dredges because of the shortage of workable land. This disturbing situation was, said Mr. Smith, by no means wholly due to the continuance of "the Emergency" for eight years. Much money and considerable time were needed for prospecting, and for the installation of plant on new mining areas.

British Tin's consolidated balance sheet at December 31, 1956, showed the market value of quoted investments at £4,919,416 compared with £4,462,321 at the end of the previous year. The Corporation made net profits after tax of £352,384 (£345,837) during its past financial year. A report of Mr. Smith's statement may be found on page 310 of this issue.

Petaling Conserves Resources.—During the current year every effort will be made by Petaling Tin to press on with the deviation of the Klang River. This will involve heavy expenditure and the company's financial resources must therefore be conserved. A substantial improvement will thus have to take place in the company's returns, before dividends can be resumed.

Golden Horse Shoe Liquidation.—An extraordinary meeting of the Golden Horse Shoe (New) has been convened for March 18, 1957, for liquidating the company. It seems possible that the company's investments, Treasury Bills, cash and debtors, less liabilities, should realize approximately 1s. per 2s. 6d. share.

W.M.C. Calls Up 6s. 6d.—Notice of a second and final call of 6s. 6d. per share has been sent to holders of Western Mining Corporation's 931,450 contributing shares. The last day for payment will be April 30.

Rhokana's Uranium.—It has been reported that the small uranium plant at Rhokana Corporation will be brought into production shortly.

RECENT INTERIM DIVIDEND ANNOUNCEMENTS

Company	Year ending	Dividends latest	Dividends corresponding	Date payable	Total last year
		%	%		%
Capper Pass	31. 3.57	2	2	Mar. 5	8
Tekka Taiping	30.11.57	15	Nil	—	Nil
Rambutan (*a*)	30. 6.57	8	10	Mar. 8	52

(*a*) Present capital is £62,500 in 12s. 6d. shares. Last year's corresponding interim paid on £100,000 capital. Total of 52% for 1955/56 is calculated on present capital.

SECONDHAND GEOPHYSICAL or low resistance megger earth tester required for prospecting. Accessories not important but geophysical equipment must comprise generator and ohmmeter units. Please reply Box A.297, c/o Central News Ltd., 43 London Wall, London, E.C.2.

UNDERGROUND SHIFT BOSSES required for GOLD MINE in TANGANYIKA. Good experience in hard rock lode mining essential. Inclusive salary £90 p. m. with free accommodation; pension scheme; 30-month tours with 5 months' paid leave on completion; outfit allowance.

Apply giving full particulars to Personnel, Colonial Development Corporation, 33 Hill Street, London, W.1, quoting Serial 303.

MECHANICAL AND ELECTRICAL ENGINEERS required by N.C.B.'s Reconstruction Dept., at London H.Q. Appointments (superannuable) according to qualifications and experience within inclusive ranges stated. Appropriate technical qualifications are required, and the vacancies are:—

Head of Mechanical Engineering Section; concerned with the assessment of technical and economic merits of mechanical equipment and the standardization of layouts and equipment for reconstruction projects. Applicants should preferably have had experience in the layout and selection of plant and equipment for new collieries or for major reconstructions at existing collieries, and have some knowledge of the site problems associated with such reconstructions. £1,750-£2,500 (X.624/J).

Mechanical Engineers preferably with design and practical experience of colliery plant and layouts, particularly surface, shaft and mechanical handling equipment. Some experience of major reconstruction work at collieries would be an advantage. £1,200-£1,750, or £800-£1,400 according to qualifications and experience. (X.625/J).

Head of Electrical Engineering Section. Duties include assessing the technical and economic merits of equipment and advising on selection. Applicants should be eligible for corporate membership of the I.E.E., and preferably have some knowledge of the requirements for the complete electrification of collieries and of the electrical equipment for new collieries and major reconstructions. £1,500-£2,000. (X.626/J).

Electrical Engineer with knowledge of the electrical requirements for collieries and of the equipment associated with electrification and reconstruction of collieries. £800-£1,400. (X.627/J).

Write, with full particulars of age, education, qualifications and experience, to National Coal Board, Staff Dept., Hobart House, London, S.W.1, *marking envelope with relevant reference number* before March 18, 1957.

Obituaries

GILBERT McPHERSON

Gilbert McPherson, M.C., M.I.M.M., Consulting Engineer to Selection Trust Ltd., died suddenly on February 28. He was 58.

Born at Machrihanish, Argyllshire, in 1899, Mr. McPherson was educated at Kilmarnock Academy, and Allan Glen's School, Glasgow. Without completing his courses, he left school to learn to fly at Hendon when he was 16. At the end of the first World War, while still only 18, he had been awarded the Military Cross, and held the rank of Captain in the Royal Flying Corps.

He received his technical training at the Camborne School of Mines where he obtained his associateship in 1921. Following some civil engineering constructional work in Scotland, he went to Cornwall and became manager of Wheal Jewell and Mary Tavy Mining Co., and then underground manager of Tresavean Mine, Lanner. Subsequently, he joined the staff of Selection Trust in the year 1926 as office engineer.

In his early work with that company he was connected with its exploration activities in what later developed into the Copper Belt of Northern Rhodesia and also with the Yugoslav enterprise out of which came the well-known Trepca Mine. His early ability was soon recognised by Mr. (now Sir) Chester Beatty and he was later made a director of the Yugoslav companies of which Sir Chester was chairman.

During World War II he was loaned to the Ministry of Supply and was intimately connected with the supply of explosives, being Deputy Director of Production, Royal Filling Factories. On completion of his war work he returned to Selection Trust and was appointed Consulting Engineer, which position he held until his death.

Gilbert McPherson had several outstanding qualities which were readily admired and appreciated by those who worked with him. He possessed an uncanny capacity for being able to perceive with alacrity the many problems which had to be faced in his work, a clarity of expression which enabled him to delineate and present with unusual lucidity his reports on a variety of subjects, and a determination and intensity which allowed him to contribute in great measure to the exploration activities in which Selection Trust was actively engaged.

He was generous in imparting both his knowledge and his experience and many of those associated with him willingly admit the debt they owe him. Though at times his individuality and his forthrightness in expressing his views did not allow him to see eye to eye with his associates, these characteristics did not obscure his great merits or prevent him making a valuable contribution to the matters under consideration.

His outstanding ability, his versatility and not least his great loyalty were attributes which engendered a genuine regard and respect. Mr. Chester Beatty, the present chairman of Selection Trust says of him:—

"The company has lost one of its oldest and most loyal employees whose wise advice has contributed greatly to its accomplishments over its history."

PAUL GRODZINSKI

We regret to record the death of Dr. Paul Grodzinski, following a heart attack. He was 56.

Dr. Grodzinski devoted much of his time to the study of the property and applications of diamond and other hard materials. In 1943 he was appointed by the Diamond Corporation as head of the Industrial Diamond Information Bureau, a part of the research organisation of Industrial Distributory (Sales) Ltd. He was technical editor of the *Industrial Diamond Review* and was responsible for the publication of *The Bibliography of Industrial Diamond Applications*. He has also published a large number of technical articles and has lectured in Germany, Great Britain, South Africa and elsewhere. His last book, *Diamond Technology*, a volume of nearly 800 pages which in many ways amounted to his life's work, had a great success in the English language and at the time of his death was being translated into Spanish, German and French. Dr. Grodzinski held a number of patents and his own inventions included a double cone indenter for hardness testing.

GODFREY CRESSWELL HUTCHINSON

The death has occurred of Mr. Godfrey Cresswell Hutchinson, chairman of Tanganyika Holdings. Mr. Hutchinson was also a director of the Zambesia Exploring Co., the Zambesia Investment Co., the Rhodesia-Katanga Co., and Kentan Gold Areas. In 1938 he succeeded Sir Robert Williams as managing director of the Tanganyika Concessions, an office which he retained until 1950 when the company emigrated to Southern Rhodesia. In recent years he retired from his office of managing director of the associated companies mentioned, and also from the boards of Union Minière du Haut Katanga and the Benguela Railway Co.

Rand & Orange Free State Returns for February

Company	February, 1957 Tons (000)	Yield (oz.)	Profit† (£000)	Year ends	Current Financial Year Total to date Tons (000)	Yield (oz.)	Profit† (£000)	Last Financial Year Total to date Tons (000)	Yield (oz.)	Profit† (£000)
Goldfields										
Doornfontein (*a*) ..	77	31,204	152·4	J	605	241,130	1133·3	414	166,539	660·5
Libanon	96	21,757	53·6	J	774	173,666	436·3	776	169,605	454·8
Luipaards Vlei (*b*) ..	77	13,669	8·1	J	652	116,917	77·5	—	—	—
Rietfontein	25	5,704	16·2	D	51	11,404	31·9	52	11,804	36·7
Robinson	72	14,400	5·1	D	144	28,984	9·4	156	34,484	22·6
Simmer & Jack	93	17,062	15·6	D	188	34,464	32·4	198	35,230	26·1
Sub Nigel	64	16,864	29·3	J	528	149,320	386·1	530	166,055	614·2
Venterspost	120	28,740	58·1	J	987	224,838	526·2	960	227,936	590·8
Vlakfontein	48	16,960	81·1	D	96	34,055	164·0	76	28,164	137·7
Vogels (*a*)	98	22,785	57·4	D	198	46,285	117·9	203	51,743	172·4
West Drie (*a*)	75	71,288	581·9	J	600	562,385	4624·6	568	454,834	3617·2
Anglo American										
Brakpan	100	17,100	6·8	D	208	35,569	19·8	210	35,858	26·0
Daggas (*a*)	215	47,869	259·3	D	430	95,814	519·0	405	92,641	525·4
East Daggas	92	15,161	31·0	D	186	30,601	62·6	188	31,183	71·1
F.S. Geduld (*a*) (*c*)..	49	26,349	133·2	S	236	116,313	541·0	68	22,583	45·2
Loraine (*a*)	62	11,845	L5·7	S	304	58,140	L36·2	206	34,038	L142·4
President Brand (*a*) .	60	46,299	380·6	S	301	231,408	1906·5	260	208,248	1723·1
President Steyn (*a*)..	90	34,528	195·0	S	443	172,058	1000·4	415	150,407	834·9
S.A. Lands	85	18,810	64·7	D	170	37,611	129·9	170	33,546	96·1
Springs	122	13,570	5·7	D	247	28,195	13·2	250	30,786	2o·8
Vaal Reefs (*a*) (*d*) ...	55	23,833	138·9	D	110	47,265	272·5	—	—	—
Welkom	85	21,533	45·1	S	427	106,134	227·9	408	85,386	95·5
Western Holdings...	89	40,875	266·7	S	441	198,908	1277·8	372	141,920	838·2
West Reef Ex.....	119	25,663	60·0	D	239	51,480	119·4	228	45,166	96·0
Central Mining										
Blyvoor (*a*)	99	56,481	401·5	J	836	471,249	3429·7	831	471,615	3437·5
City Deep	139	27,296	17·0	D	297	58,164	35·6	288	55,780	5·2
Cons. M.R.	150	21,763	7·0	J	1,304	182,893	71·4	1,352	192,845	137·5
Crown	218	32,301	L5·6	D	483	70,749	L14·0	552	89,449	75·4
D. Roodepoort	170	29,758	44·6	D	358	62,642	101·2	346	58,911	95·4
East Rand Prop.....	195	51,675	147·2	D	406	107,270	314·9	401	104,264	342·5
Harmony (*a*)	74	28,874	140·2	J	618	211,993	1256·8	577	218,925	1110·0
Modder East	125	13,066	4·0	J	1,104	113,855	11·0	1,029	108,985	56·9
Rose Deep.....	46	7,231	0·1	D	95	14,854	0·3	90	14,836	6·0
J.C.I.*										
E. Champ d'Or (*a*)..	11	291	L23·1	D	23	641	L49·4	33	2,007	L75·9
Freddies Cons. (*a*) ..	51	12,991	L27·0	D	107	26,748	L55·5	141	24,181	L99·2
Govt. G.M.A. (*a*)...	132	19,545	L42·3	D	284	43,685	L53·6	460	58,966	10·1
Randfontein (*b*)	74	13,541	25·1	D	157	27,463	53·3	—	—	—
Union										
East Geduld	128	39,373	271·3	D	268	82,599	574·1	271	84,593	598·6
Geduld Prop.	98	15,539	24·6	D	205	32,482	51·4	205	28,566	73·7
Grootvlei	180	38,643	200·8	D	377	80,806	421·7	370	80,100	435·9
Marievale	67	17,692	78·5	D	139	36,588	162·9	137	35,801	163·5
St. Helena	110	32,448	177·4	D	230	67,239	367·8	182	56,155	300·3
Van Dyk	74	12,199	2·5	D	154	25,371	5·3	158	25,917	2·3
General Mining										
Buffelsfontein (*a*) (*e*).	87	24,225	82·2	J	167	45,225	142·5	—	—	—
Ellaton (*a*)	31	6,556	14·0	D	63	13,306	29·3	62	15,048	59·0
S. Roodepoort	27	6,363	22·2	J	231	53,946	196·7	220	50,096	177·9
Stilfontein (*a*)	93	39,525	244·5	D	184	78,194	486·0	167	65,641	389·6
W. Rand Cons. (*b*)..	132	18,294	3·8	D	272	37,746	9·6	—	—	—
Anglo-Transvaal										
Hartebeestfontein (*a*)	80	41,800	258·0	J	680	289,378	1749·7	406	176,147	863·8
N. Klerksdorp (*a*) ..	10	1,182	L5·2	D	20	2,411	L10·4	20	2,497	L9·6
Rand Leases	155	24,568	4·7	J	1,248	194,074	L176·3	1,408	225,034	196·6
Village M.R.	30	5,061	7·0	J	264	41,752	67·3	292	40,302	75·2
Virginia O.F.S. (*a*) ..	95	25,175	64·5	J	731	161,155	459·1	569	121,828	280·7
Others										
N. Kleinfontein	90	10,288	L16·7	D	190	21,600	29·3	206	24,306	6·5
Wit Nigel	18	3,955	7·2	J	144	31,886	63·0	147	30,755	63·8

Gold has been valued at 248/9d. (January 249/-) per ounce fine. Operations at Merriespruit remain suspended.
L indicates loss. † Working Profit. *Working Profit includes sundry revenue. (*a*) Excluding revenue from Uranium, Acid and Pyrite. (*b*) Gold Division only. (*c*) Production began January 1956. (*d*) Production began May 1956, (*e*) Production began January 1957.

BRITISH TIN INVESTMENT CORPORATION

INCREASED NET REVENUE

BASIS OF INVESTMENTS
FURTHER BROADENED OUTLOOK FOR TIN

MR. S. H. SMITH'S STATEMENT

The twenty-fifth annual general meeting of British Tin Investment Corporation, Ltd., will be held on March 27 at St. Swithin's House, 11/12 St. Swithin's Lane, London, E.C.

The following is the Statement by the Chairman, **Mr. S. H. Smith, O.B.E., M.C.,** which has been circulated with the report and accounts for the year ended December 31, 1956:

In recent years the Corporation has made investments in an increasing number of companies registered abroad and it has no reason to regret such widening of its basis. But this increase in the number of our foreign investments has inevitably led to additional commercial, administrative and accountancy complexities. After careful consideraton, your Directors decided that it would be of definite advantage to the Corporation to form a wholly owned subsidiary company to take over the Corporation's investments in companies *registered* abroad. (To prevent misunderstanding, I must emphasize that this does not extend to all companies *operating* abroad in which the Corporation holds shares; indeed, nearly all our investments come within the latter category.)

Formation of Subsidiary Company

Accordingly, on July 31 1956 we formed B.T.I.C. (Overseas) Limited with a capital of £5,000, and with its financial year ending on November 30 in each year. Your Directors are satisfied that it will be a real benefit to have a separate subsidiary company to hold the Corporation's foreign investments which are directly affected by foreign exchange control regulations, foreign tax laws and practice, fluctuations in exchange rates, local regulations as to transfer of securities, remittance and collection of dividends and kindred matters. The formation of B.T.I.C. (Overseas) Ltd. will simplify control, administration and accountancy and will dissolve at least some of the obscurities inseparable from investment in overseas companies. The change has already resulted in savings which have made it worthwhile from a financial as well as an administrative point of view.

As a consequence of the formation of B.T.I.C. (Overseas) Ltd., a material portion of the Corporation's portfolio, of course, no longer appears under its former heading in the Corporation's Balance Sheet, where it has been replaced by a corresponding increase in the item "Investment in Subsidiary Companies". A good deal of the income which hitherto came into the Corporation's Accounts now goes into the new subsidiary's Accounts. For that reason your Directors consider that a Revenue Account for the group as a whole will give members a more adequate picture of the position than could otherwise be readily obtained, and a separate Revenue Account for the parent Corporation alone no longer serves a useful purpose.

Alteration of Accounting Basis

The opportunity presented by the incorporation of the new subsidiary has been taken to alter the accounting basis, in respect of income from investments in companies registered abroad, to a "dividends received" basis instead of, as formerly, a "dividends declared" or accrual basis. By closing the new company's financial year a month earlier than that of the Corporation, we are also able to obtain repayments of certain of our tax credits at an earlier date. These alterations have resulted in the group net income for the year 1956 being reduced by about £14,000 below what it would have been if the changes had not been made. The benefit of this income has not, of course, been lost but merely postponed and, in future years, the Accounts will be credited with a full year's income on the basis of the dividends actually received by the new subsidiary company.

The Year's Revenue

The revenue of the group for the year ended December 31, 1956, after deducting administrative and other expenses but before charging taxation, was £627,894. This compares with £644,860 for 1955. The administrative and general costs of the group were £10,461 in 1956 as against £10,959 in 1955. For taxation we had to provide £275,510 in 1956. The net revenue of the group after taxation was £352,384 against £345,837 in 1955. After bringing in £7,885 from tax adjustments on previous years, and deducting £10,247 retained in the Accounts of the subsidiaries, the net revenue attributable to the Corporation was £350,022. To this must be added £124,618 brought forward from 1955.

The available balance is consequently £474,640. The interim dividend of 7% paid in August 1956 absorbed £84,730. Your Directors now recommend the payment on March 28 1957 of a final dividend of 21% which will require a net amount of £254,189 and will leave £135,721 to be carried forward.

A reduced interim dividend was paid in 1956 because, at the time when the dividend was declared, your Directors were in doubt as to whether the full year's income would warrant the payment of 7½%. Happily, our doubts have proved unjustified.

Value of Quoted Investments

The total book value of the quoted investments of the group as at December 31, 1956 was £2,526,381. These investments at that date had a market value of £4,919,416. The comparative figures at December 31, 1955 were £2,479,010 and £4,462,321 respectively. Unquoted securities are now carried in the books of the group at £1,127 which is approximately 0.05% of the total portfolio.

During the year we have employed such of our funds as were not immediately required for permanent investment in buying treasury bills and in making short-term loans to local authorities. This policy has enabled us to earn a satisfactory income on our surplus cash without materially affecting liquidity.

Investment Changes

The usual lists of our principal investments are set out at the end of this Statement. We have made a number of changes in our investments which are designed not only to meet changing conditions and have regard to the prospects of the companies in which the group is interested, but also to continue, to a small degree, the policy of broadening the basis of the Corporation and its subsidiaries.

We have further expanded our holding in oil shares including the making of small investments in some of the leading American companies.

Certain changes have been made in our list of copper and lead/zinc shares, and we have also taken small interests in some of the rarer metals including platinum, vanadium, molybdenum and titanium.

Tin Mining Shares

But there has been little overall change in the proportion, measured by market value, which our holdings in tin mining companies bear to our holdings in other companies. The market value of our tin mining shares at December 31, 1956 was still roughly two-thirds of the total market value of the portfolio.

For that reason, the price of tin and the prospects of the tin mining industry and the political outlook in Malaya continue to be of the greatest importance to the Corporation. The average prices of Cash Standard Tin on the London Metal Exchange for the last three years were as follows:—1954, £719; 1955, £740; 1956, £789. The highest price for tin in 1956 was £890 on February 27 and October 31 and the lowest price was £724 on June 1. The price on December 31, 1956 was £778.

A Disturbing Situation

The Chairmen of a number of tin mining companies operating in Malaya have recently reported to their shareholders that some of their dredges have had to cease working because it has not been possible to acquire further land in which to work. This is a disturbing situation and it is by no means wholly due to the continuance of "The Emergency" for eight years. Much money and considerable time are needed for prospecting and for the installation of plant on a new mining area. Unless some assurance can be felt that the right to work newly-found areas will be granted, and granted speedily and on reasonable terms, overseas investors are not likely to risk further capital in tin mining in Malaya. Prospectors for tin need the stimulant of more active co-operation and encouragement from the numerous local authorities concerned, particularly in the matter of alienation of land for mining. This is not a new problem and it is hoped that prompt attention will be given to its solution.

In the view of those most competent to judge, the demand for tin is likely to increase as the standard of living rises in the under-developed areas of the world and as the tin-plate and other world industries which require tin continue their vigorous expansion. No adequate substitute for tin has yet been found and, thanks largely to the admirable work of the Tin Research Institute, new uses for tin have been discovered and existing tin products have been materially improved, both technically and economically. On the other hand, costs of production in Malaya continue to rise and the burden of taxation remains heavy.

International Tin Agreement

The International Tin Agreement, to which I referred in my Statement last year, was not finally ratified by the requisite number of tin producing and con-

suming countries until the summer of 1956. It has now become operative. Under the Agreement a Buffer Stock of 15,000 tons of tin metal or their equivalent in cash has to be provided by the producing countries, and Malaya's share of the Stock is 5,491 tons of metal or their cash equivalent at £640 per ton of metal. As the price of tin has been above £640 for some time, producers are naturally unwilling to contribute their metal to the Stock and the Malayan Government has, in most cases, provided the cash alternative. That Government is calling upon the producers in Malaya (other than those who have made their own cash contribution to the Stock) to repay its proportion of the Buffer Stock contribution by means of a compulsory levy based on each producer's output and varying with the price of the metal. The amount so collected from producers will be repaid on the partial or complete liquidation of the Buffer Stock. In the meantime, the Buffer Stock consists solely of cash and, so far as is known, has no metal and the Manager of the Stock has not yet been called upon to operate. The machinery for the Buffer Stock Scheme is, however, available and can be readily utilized should the price of tin return to lower levels.

Important Political Developments

There have been important political developments in Malaya in 1956. "The Emergency" due to Communist activity still persists, but Communist forces are steadily losing power and disaffected areas are being brought under Government control. The first elected Government of the Federation of Malaya has in 1956 had time to establish itself and has shown firmness and fairness and the determination to govern with a full sense of responsibility. The Home Government has promised to give to the Federation independence within the Commonwealth, if possible by August 1957. Great political developments such as these inevitably carry their own risks as recent events in other parts of the world have clearly demonstrated and they are risks for all, not least for overseas investors who have ventured their money in local enterprises. It is, therefore, reassuring to learn that the High Commissioner, when speaking on behalf of the new Government to the Federal Legislative Council, said that "it is and will remain the policy of the Government to accord to industry and enterprise fair and considerate treatment; to foster an atmosphere in which the overseas investor who is genuinely concerned with the development on sound lines of the country's productive resources can invest and conduct undertakings in this country without fear of discrimination or unfairness; and last but not least, to continue the present policy whereby the overseas investor can, after payment of local taxes and obligations, remit to his country, within the framework of ordinary and reasonable Exchange Control requirements, funds for the payment of dividends and for the repatriation of his capital."

Policy of Malayan Government

On other occasions Malayan Ministers have formally stated that there will be no nationalisation of industry, that it is the policy of their Government to attract foreign capital, and that it is not proposed to change the rate of tax on companies because it is the policy of the Government to attract investment, and the maintenance of a favourable tax position is conducive to that end. These are all assurances upon which we are entitled to rely.

During 1956 there was considerable labour unrest in the mining industry in Malaya. Much of this was undoubtedly attributable to the inexperience of some of the leaders of the new Trade Unions who too often used their powers for purely political purposes. That sort of thing is not unusual in a country which is rapidly passing through great political and industrial change. It is reasonable to expect that, as the Trade Union leaders gain experience and become more truly representative of their members, they and their Unions will pay more attention to their legitimate industrial aims and less to political propaganda.

Copper Outlook

The average price of Cash Standard Copper during 1956 was £329 compared with £352 in 1955. The price on December 31, 1956 was £268. The year 1956 was relatively free from strikes in the copper producing areas and, with increased supplies consequently coming forward, a greater degree of equilibrium resulted and the price of copper declined to a more normal level. Nevertheless, when consideration is given both to the greatly increased costs of producing copper and to the permanent long-term rise in the demand for this metal, any further substantial fall in the price seems unlikely, unless an entirely unexpected major recession develops in the United States. We are, therefore, satisfied to hold our copper shares as a long-term investment.

The average price of lead for the year was £116, compared with £106 for 1955. During the year the demand for lead has remained good and, provided that there is no unexpected decline in the demand, particularly from the automobile industry, the prospects for this metal continue to be satisfactory.

Zinc Prices

The 1956 average price for zinc was £98, compared with £91 for 1955. There is no doubt that, but for very substantial purchases by the American Government, both for strategic stockpile requirements and also in exchange for agricultural commodities under the barter scheme, the price of zinc, both in the United States and in the United Kingdom, would have fallen. Much, therefore depends on the continuance of American Government purchases, but present indications are that the American Government will from time to time continue to purchase both zinc and lead. Therefore the outlook for the immediate future for both these metals is for steady prices.

I think we have every reason to expect a satisfactory income in 1957 from the tin mining and other companies in which we have invested.

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THE CONSOLIDATED MINES SELECTION COMPANY LIMITED

STRONG INVESTMENT POSITION

The following is an extract from the statement by the chairman, **Mr. A. C. Wilson,** which has been circulated with the annual report and accounts for 1956.

The year under review has been a very difficult one insofar as share realisations and new business are concerned. On the other hand, results from new gold mines in which we have substantial investments have been highly satisfactory and dividends from these mines have played a significant part in the increase in our income. This process may be expected to continue through the receipt of higher dividends from these mines. Coupled with this, the dividends from the new mines will, in due course, be reflected in increased distributions by the interested finance companies, in particular, West Rand Investment Trust and Orange Free State Investment Trust. We can thus look forward to expanding revenues and to reaping the reward of patience in the past.

The depressed state of the share market precluded us from making realisations of investments with the result that revenue from this source was abnormally low. New investment was on a moderate scale, and the aggregate value of quoted and unquoted shareholdings differs only slightly from the figure at the end of 1955.

Prospecting Interests

Intense prospecting activity is taking place in Africa and we subscribed further capital for the three prospecting companies in which we have shareholdings. As a result of our prospecting interests we acquired a participation in Umgababa Minerals Limited, a company formed to acquire and exploit a deposit in Natal containing titanium in the form of ilmenite and rutile.

We continued to assist in the financing of mining companies by way of loans at commercial rates of interest. This type of business has proved very profitable in the past, as apart from the fair return we get on our money, share subscription rights are usually attached to the financing unless it is of a very short-term nature.

In spite of low prices ruling in the share market, our investment position continues to be a strong one. The overall market valuation of our investments showed a total appreciation over book value at December 31 amounting to £2,400,000; this figure is taken moreover at a time when shares of mines like President Brand and President Steyn, after paying increased dividends and showing continuing progress, stood at a lower level at the end of the year than they did at the beginning.

It is proposed to maintain the dividend at the same rate as for 1955. With the building-up of dividend income we have now reached a position where this income, after deduction of all expenses and the provision for taxation on the total profit, almost covers the existing rate of distribution to stockholders. As regards the future, we confidently anticipate that unless anything unforeseen occurs, our dividend income for the current year will compare favourably with last year's figure.

NATIONAL BANK OF INDIA

AMALGAMATION WITH GRINDLAYS BANK

The annual general meeting of The National Bank of India, Ltd, will be held on March 26 in London.

The following are extracts from the circulated Statement of the Chairman, **Mr. J. K. Michie,** for the year 1956 :—

Ever since we acquired from the National Provincial Bank Ltd. the total capital of Grindlays Bank Ltd. the interests and managements of Grindlays Bank and ourselves have naturally grown more closely together and it has become increasingly clear as experience accumulated that to ensure the full benefits of this association a physical fusion of resources and staff must be the ultimate step. The Boards of both Banks have now decided that the time is ripe for an amalgamation and the necessary preliminaries have been set in motion.

Larger Net Profit

Our Net Profit figure is somewhat larger and after full provisions for taxation, bad and doubtful debts and other necessary reservations comes out at £432,835 against £421,839 the previous year. Dividends declared are unchanged at 15% for the year. £100,000 has been transferred to Premises Account against £75,000 and £75,000 to Contingencies Reserve Account against £85,000 in 1955. The balance carried forward is increased by £11,888.

All Indian economic activity is being dominated by the Second "Five-year Plan" which has recently been widely commented on in the financial press.

Despite legitimate mental reservations as to the timing and correlation of certain sections of the plan and some doubt, having regard to the country's apparent resources—the significant reduction in her sterling balances has to be taken into account—whether too much is being attempted too quickly, it is generally agreed that the plan is imaginative and certainly reflects a dynamic outlook and determination on the part of the Government. All people of goodwill will wish the plan the greatest possible success.

Grindlays Bank Ltd. :—

I am glad to report another successful year's operations which is reflected in the profit figure shown in their accounts and the growth in the volume of the Bank's deposits has been well maintained. As in our own case all necessary provisions have been internally made including any depreciation on the Bank's holding of Government securities. During the year two further Branches have been opened in the Rhodesias and results of operations there show a considerable improvement and are encouraging.

Our Finance and Development Corporation again operated at a profit which is being retained in the business.

Prospects

When I last addressed you we had just had a rise in the Bank Rate to 5½% in a further attempt to curb inflationary tendencies. The situation was apparently improving when the economic results of the Suez crisis fell upon us. By dint of calling up our reserves the critical phase has been by-passed and money has been plentiful enough to justify an adjustment of the Bank of England rate to 5%. I say adjustment advisedly for on the authority of the Governor of the Bank of England that is all it is and we shall have to work hard for any further improvement in our monetary situation, whether expressed in gold and dollar balances or interest rates, and obviously they go together.

This is no time to attempt prophecy; the imponderables are too many and certainties too few but as has been said before no one owes this country a living and it can only be through the wisdom of our Government and the efforts of all our people that our present economic difficulties will be resolved; and surely there is nothing insurmountable about them so long as we do not spend as if we still had a large unearned income behind us.

Interest Rates

Last year I remarked on the disparity between interest rates in London and those current in certain other countries. This gap has since been narrowed but in to-day's relative circumstances it is in some cases still too wide. Supply and demand will doubtless have their way in due course.

As to our own prospects, given reasonable operational conditions I feel sure our forward progress will continue.

I wish again to thank our Staff throughout our widespread organization. Banking is a service and it is in its quality that the seeds of success lie. From my observations we have nothing to fear on that score.

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BURMA MINES LIMITED

The following summarises the Operating results of BURMA CORPORATION (1951) LIMITED (Incorporated in the Union of Burma and jointly owned by Burma Mines Limited and the Union Government) for the SIX months ended 31st December, 1956.

ORE EXTRACTION

Quarter ended 30th September, 1956	31,597 tons
Quarter ended 31st December, 1956	30,342 tons
	61,939 tons

PRODUCTION

Quarter Ended	*Concentrating Ore Milled (dry tons)*	ASSAYS *Ozs. Silver*	*% Lead*	*% Zinc*
30 September 1956	31,451	13.43	16.67	10.04
31 December 1956	30,615	13.98	16.91	10.56

Marketable products were as follows :—

Quarter Ended	*Refined Lead Tons*	*Refined Antimonial Lead Tons*	*Refined and Dore Silver Fine Ozs.*	*Copper Matte Tons*	*Nickel Speiss Tons*	*Zinc Concentrates 56%-58% Zn. Dry Tons*
30 September 1956	3,787	—	318,384	88	10	3,479
31 December 1956	3,423	157	316,612	103	135	3,328
	7,210	157	634,996	191	145	6,807

ESTIMATED REVENUE AND EXPENDITURE

	For Quarter ended 31st December, 1956		*For the SIX months ended 31st December, 1956*	
Gross Revenue (after adjustment of value of Metal Stocks)	K.96,40,100	£723,007	K.1,90,52,600	£1,428,945
Operating Expenditure	K.62,12,200	£465,915	K.1,20,91,400	£ 906,855
Operating Profit	K.34,27,900	£257,092	K. 69,61,200	£ 522,090
Estimated Taxation	K.17,66,500	£132,487	K. 36,12,300	£ 270,922
Estimated Depreciation	K. 2,33,000	£ 17,475	K. 4,35,500	£ 32,663
Capital Expenditure	K. 6,08,300	£ 45,623	K. 8,92,200	£ 66,915

After deducting the foregoing estimates for Taxation and Depreciation the estimated Net Profit for the SIX months is K.29,13,400 (£218,505).

The Sterling figures shown are based on a Rate of Exchange of 1/6d. per Kyat.

37, Dover Street, London, W.1.